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BRESADOLA [1]

WILLIAM ALPHONSO MURRILL

(WITH PLATE 10)

How did Bresadola become one of the greatest mycologists? The answer should be very encouraging to young naturalists in almost any part of the world, no matter how far removed from libraries and museums.

Born in an humble and obscure home, with few of the so-called "advantages" of modern life, he nevertheless improved his opportunities as they came; working devotedly, conscientiously, and with determination.

Busied with affairs of the Church, mycology was with him a side-issue—a hobby—until very late in life. He loved the mountain forest and studied the plants as a diversion, finding rest, peace, and contentment in the green solitudes. I have walked with him for hours in his beloved Tyrol, hardly speaking a word until we happened upon something unusual.

When he made specimens, he made *good* ones, selecting good plants and drying them with great care. Thus he built up a splendid herbarium, containing quantities of duplicates for exchange. As these were carefully studied and properly named, he had no difficulty in trading them for other specimens which did not occur in his own territory. Naphthalene was used freely by him and no insects were allowed to develop in his herbarium.

When curators of museums found him expert, careful, and honest, they loaned him type material in abundance; and this,

[1] Bresadola, Giacomo. Born February 14, 1847. Died on June 9, 1929.

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studied at leisure, gave him a rare insight into European species and nomenclature. In this way, although too busy and too poor to travel, the advantages of travel were brought to his door.

In the matter of language, also, he improved his rather exceptional opportunities. In talking with me, he used Italian, French, and German with facility, often throwing in a passage of Latin or Greek without knowing it. He could speak, I believe, eight languages fairly well and read a number of others. English pronunciation, however, always proved a stumbling-block too difficult for him to master at his age.

He used his knowledge of language to good purpose in conversing with visiting botanists, reading pamphlets sent to him, and carrying on an extensive correspondence with mycologists in other lands. Linnaeus hated Latin until he discovered that it was the language of botany; Bresadola took to language, both alive and dead, as a duck to water—and it served him well.

Much might be said of the work and writings of this great, good, kind-hearted man; but why repeat what is already well known to most mycologists? I wished only to say a word to the young naturalist who is struggling along under disadvantages. Bresadola began at his doorstep and by careful, devoted study gradually became acquainted with certain plants in his own neighborhood. He developed and used all his natural powers, and the circle of his acquaintance widened until it embraced the world!

PHOTOGRAPHS AND DESCRIPTIONS OF CUP-FUNGI—X. ASCOTREMELLA [1]

FRED J. SEAVER

(WITH PLATES 11 AND 12)

In 1917 Dr. H. M. Fitzpatrick of Cornell University sent the writer some fungi which, without microscopic examination, were at once pronounced tremellaceous species since they were decidedly tremelloid in consistency. The specimens were later found to be ascigerous and referred by the late Dr. E. J. Durand to *Haematomyces faginea* Peck, a species and genus entirely unknown to the writer at that time. The material was named and filed away for future study.

Recently the writer undertook a detailed study of the genus *Haematomyces* as represented by the species named above. The type was borrowed from the State Museum and a detailed study at once showed it to be different from the material sent from Ithaca, although apparently congeneric.

In the meantime (1919) specimens were received from Dr. Dearness of Ontario which did agree perfectly with Peck's specimens and description. These were determined by the writer and incorporated in the collection. Recently it was learned that Dr. Dearness had excellent photographs of this species made from fresh material and the writer has secured prints which he has been permitted to use through the courtesy of Dominion National Museum of Canada.

In the course of these studies it has been concluded that there are two different forms which the writer regards as distinct species. It has also been learned that Dr. Durand had recognized two forms as shown by notes sent from the Department of Plant Pathology at Ithaca although there is nothing to indicate

[1] This paper is preliminary to a monograph of North American Cup-fungi (Inoperculates), a companion volume to North American Cup-fungi (Operculates), which was published by the author and issued in December, 1928.

that he regarded them as specifically distinct. Probably his studies had not been carried far enough at that time.

Since little is apparently known of these forms, it seems very appropriate to publish at this time the excellent photographs received through Dr. H. M. Fitzpatrick of Cornell University and Dr. John Dearness of Canada, together with diagnoses of the species as the writer understands them.

STATUS OF THE GENUS HAEMATOMYCES

The genus *Haematomyces* was founded by Berkeley and Broome on material collected in Ceylon. As pointed out by Petch (Ann. Bot. **33**: 405. 1919) and others, the type species *Haematomyces spadiceus* is not a fungus at all but a resinous exudation. Petch, however, suggests retaining the name in the sense later used by Peck and others. This is not a satisfactory solution of the matter since the genus as first used by Peck contained one species, *Haematomyces orbicularis*, which according to Peck was congeneric with *Haematomyces vinosus* Cooke & Ellis, which is in turn not a *Haematomyces* in the sense that Petch intended it but a *Haematomyxa*. *Haematomyces* Peck then is a straight synonym of *Haematomyxa* Sacc. and could not be used for the forms here described.

The writer, therefore, proposes the name **Ascotremella** nom. nov. for the American forms here described which are tremelloid in substance but ascigerous in fruit. The one form *Haematomyces fagineus* Peck has occasionally been collected and should be designated as the type of the proposed genus *Ascotremella*. So far as can be determined, the genus belongs with the inoperculate section of the cup-fungi. Owing to the excessive shrinking of the plants in drying it is not easy to study this character. One species reported by Petch from Ceylon which seems to belong to this genus is described as having non-operculate asci. The genus has all of the symptoms of being an inoperculate. The writer has had no opportunity to study fresh material. The following is the writer's conception of the genus as represented by the two American species known.

Ascotremella Seaver, nom. nov.

Haematomyces Authors (in part) not Berk. & Br. Jour. Linn. Soc. **14**: 103. 1875.

Apothecia densely crowded or cespitose, tremelloid sessile or substipitate; asci cylindric but often much swollen so that the spores appear relatively small 8-spored; spores ellipsoid or more or less irregular in form, usually containing two small oil-drops, hyaline; paraphyses slender, simple or branched.

Type species, *Haematomyces fagineus* Peck.

Apothecia forming cerebriform masses..... 1. *A. faginea.*
Apothecia cespitose, turbinate..... 2. *A. turbinata.*

1. **Ascotremella faginea** (Peck) comb. nov.

Haematomyces fagineus Peck, Ann. Rep. N. Y. State Mus. **43**: 33. 1890.

Apothecia tremelloid, cerebriform, reaching a diameter of 2–4 cm. or forming a continuous mass 8–10 cm. in extent, gyrose-lobate, smooth, shining, raisin colored without and within, the substance gelatinous, becoming horny when dry; asci subcylindric, reaching a length of 50 μ and a diameter of 6–7 μ; spores usually 1-seriate, narrow-ellipsoid, hyaline, 4–5 $\times$ 7 μ; paraphyses slender, slightly enlarged above.

On trunks of beach, *Fagus americana;* also reported on *Tilia.*

TYPE LOCALITY: Rainbow, Franklin Co., New York.

DISTRIBUTION: New York and Ontario.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. **43**: *pl. 4, f. 5–7.*

2. **Ascotremella turbinata** Seaver, sp. nov.

Apothecia extremely gelatinous, closely crowded when young, giving rise to cespitose clusters as they mature, the individual apothecia at first rounded, becoming turbinate or subturbinate, externally light colored, reaching a diameter of about 2 cm. and of about the same height, the substance shrinking to a thin film when dry; hymenium much darker than the outside of the apothecium, brownish, nearly circular in form, convex, plane, or very slightly concave, even or nearly so, occasionally with a few folds about the margin; asci cylindric or subcylindric, often strongly swollen; spores small ellipsoid, 3–4 $\times$ 6–7; paraphyses slender, often branched.

On rotten wood.

Type collected by Dr. H. M. Fitzpatrick in Taughannock Gorge, near Ithaca, New York, October 7, 1917.

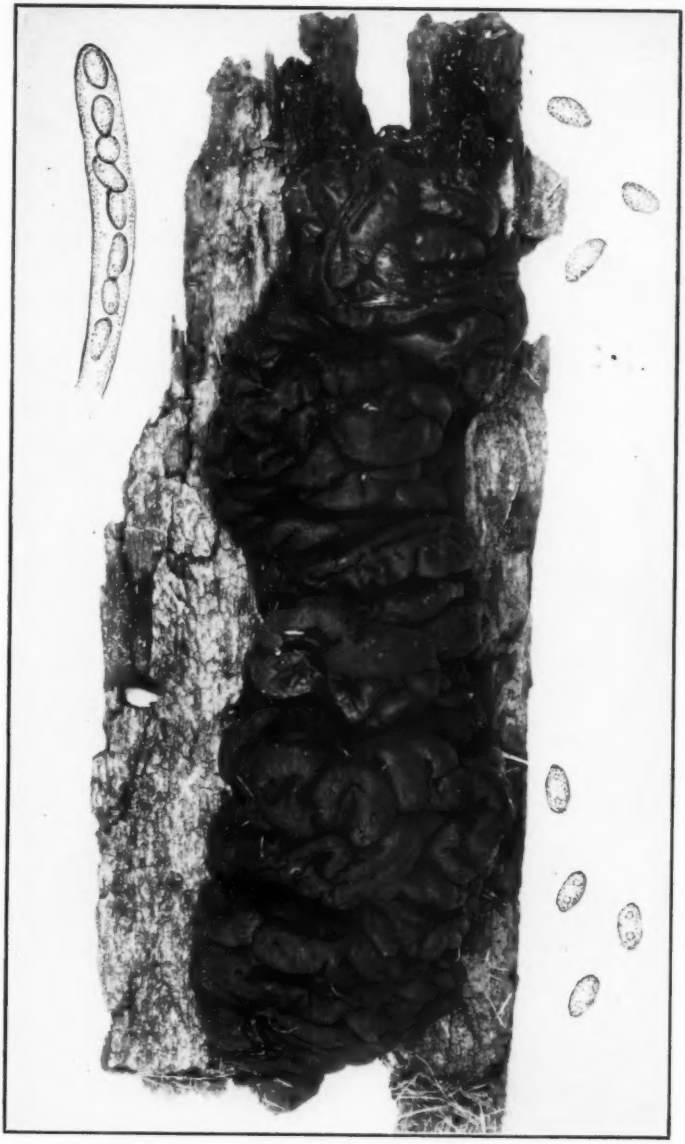
DISTRIBUTION: Known only from the type locality.

THE NEW YORK BOTANICAL GARDEN

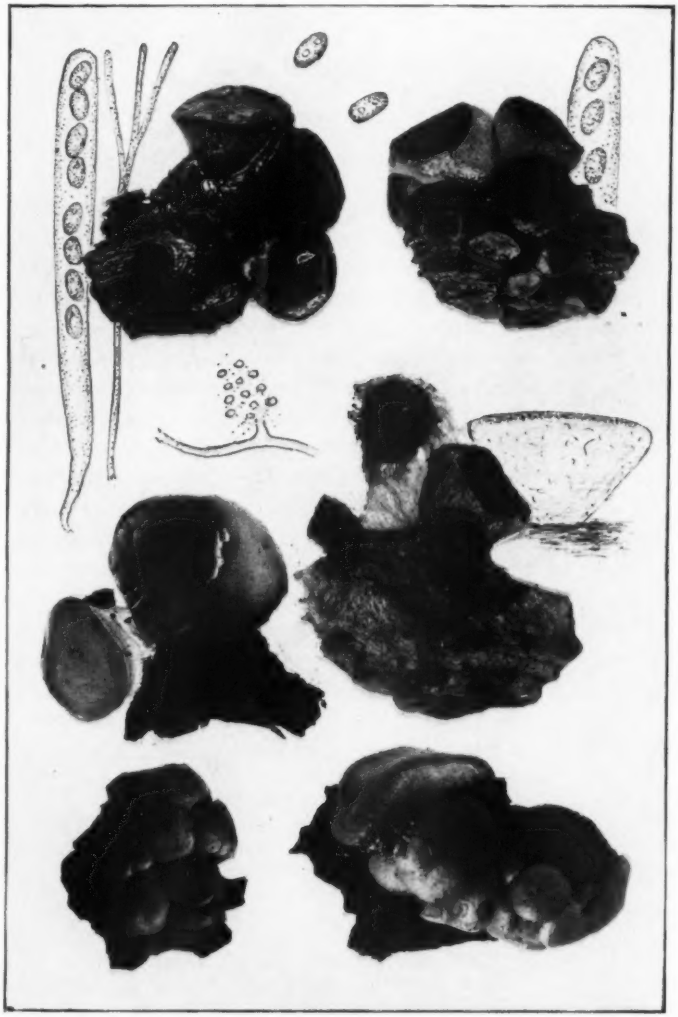
EXPLANATION OF PLATES

Plate 11. *Ascotremella faginea* (Peck) Seaver. Photograph of apothecia, about natural size, with drawings of asci and spores. Photograph by Dominion National Museum, Canada.

Plate 12. *Ascotremella turbinata* Seaver. Photographs of apothecia, with drawings of asci, spores, and diagram of section of an apothecium. Photographs by W. R. Fisher of Cornell University.



ASCOTREMELLA FAGINEA



ASCOTREMELLA TURBINATA

A NEW TRICHOGLOSSUM

J. W. Sinden and H. M. Fitzpatrick

(With Plate 13)

The genus *Trichoglossum* was separated from *Geoglossum* by Boudier (1) because of the presence of setae in the ascoma. These occur in both the stem and ascigerous portion and give the plant a velvety appearance. Durand (2) recognizes the genus in his *Geoglossaceae of North America*. He has extended knowledge of it by a careful study of the North American species and has included several new forms.

Although in other genera of the family species are separated by characters such as the nature and shape of the paraphyses, the form and color of the ascomata, the size of the asci, and the color, shape, size, and septation of the spores, Durand, after examination of a wealth of material, concluded that in *Trichoglossum* the only characters constant enough to be of use in separating species are the number of spores in the ascus and the spore length and septation. Of these characters he considers spore length to be of primary value in separation. On this basis he recognizes in his monograph five species. He separates them as follows:

A. Spores normally 100–170 μ long, narrowed each way from above the middle.
  B. Spores 4 in each ascus, 8–11-septate.. 1. *T. velutipes*
  B. Spores 8 in each ascus.
    C. Spores 15-septate..... 2. *T. hirsutum*
    C. Spores 7–14-septate..... *T. hirsutum* (atypical forms)
A. Spores normally 45–100 μ long.
  D. Spores 0–5-septate, clavate-cylindrical 3. *T. Farlowi*
  D. Spores 7-septate.
    E. Spores 55–73 μ long, clavate.... 4. *T. Rehmianum*
    E. Spores 75–100 μ long, clavate-cylindrical..... 5. *T. Walteri*

The North American material designated in the key as *T. Rehmianum* was later described by Durand (3) under the new name *T. confusum* Durand, examination of the type specimen of

Geoglossum Rehmianum having revealed that species to be distinct.

In the present paper we are concerned only with the first primary subdivision of the key, containing the long-spored species, *i.e.* those with spores 100–170 μ in length. The species which we are presenting here as new falls in this group. It will be noted that Durand includes in the section besides *T. velutipes* and *T. hirsutum* certain atypical forms of the latter species which correspond with *T. velutipes* in that the spores are less than 15-septate. In fact, he recognizes in *T. hirsutum* besides the typical material two distinct forms, one *f. variabile* Durand with spores 80–150 μ long and 8–14 (most 11–14)-septate, the other *f. Wrightii* Durand with spores 110–140 μ long and 8- or 9-septate. He says that the spores of *T. velutipes* are "broader and stouter than those of the typical *T. hirsutum*," and his measurements indicate that in *T. velutipes* the asci are somewhat shorter. In discussing *f. Wrightii* he says: "The spores are stouter than in other forms of *T. hirsutum*. In fact, they exactly duplicate those of *T. velutipes*, but there are 8 spores in the ascus instead of four as in that species." Later, having examined additional material from Bermuda, Durand (**3**) raised this form to specific rank and named it *T. Wrightii* Durand. In this connection he says, "the spores resemble those of *T. velutipes* but there are 8 in each ascus."

Durand made no further contribution to the genus and died in 1922. His manuscript notes have been available to the writers, but careful examination of these has brought to light no information of significance not incorporated in his publications. Inasmuch as all of his specimens and microscopic preparations have been at our disposal it has seemed desirable that these also be examined with a view to determining whether there exist characters of value in separating species in this genus which were disregarded by him. The specimens in his herbarium show that in form and size the individual ascomata of a given species vary as much among themselves as those of different species do from each other. While *T. Wrightii*[1] seems to constitute an

[1] Through the courtesy of Professor H. H. Whetzel specimens of the Geoglossaceae collected in Bermuda by Whetzel, Seaver, and Ogilvie have

exception to this it is represented in his herbarium only by fragments.

In the microscopic study of Durand's material spore shape and size have been given particular attention. It was hoped that these characters might have at least supplementary value in the separation of species. Critical examination of spores of *T. velutipes*, *T. Wrightii*, and *T. hirsutum* has revealed certain minor differences in shape. These, while slight, are constant enough to afford an aid in determination. However, since they are not sufficiently pronounced to provide a practical basis for separation, the characters used by Durand must still be used. These permit a division of the long-spored forms into two groups. The first consists of *T. velutipes* and *T. Wrightii*, both with spores 8–11-septate. The second contains *T. hirsutum* and its form *T. hirsutum f. variabile*, which have spores 8–15 (mostly 11–15)-septate.

In the first group *T. Wrightii* seems not to be, as Durand thought, essentially an 8-spored *T. velutipes*, for the spores of the two are easily separable on the basis of shape. Those of *T. Wrightii* are pointed at the upper end, the tapering portion being almost straight and confined to the terminal two cells, the apical portion of the spore resembling somewhat the sharpened end of a pencil (FIG. 4). The spores of *T. velutipes* are distinctly blunt at the upper end, and the tapering termination is curved (FIG. 2). In length and septation the spores of the two species are indistinguishable.

Durand states that the spores of *T. hirsutum* are normally 15-septate, and that in *f. variabile* the number of septa is less (8–14). In our examination of his material it was found that, while in *T. hirsutum* the spores are usually 15-septate, individuals occur in which the septation is often greater or less than fifteen. Examination of immature spores shows that the normal septation

been made available for examination. These contain numerous rich collections of *T. Wrightii*. This species is said by Professor Whetzel to be the most common and abundant member of the family found on the Islands. In gross aspect it seems distinct from all other members of the genus. The ascoma is almost spathulate, being strikingly compressed, and the ascigerous portion is scarcely distinct from the stem, the whole plant usually tapering from near the apex to the base.

is the result of successive equal divisions of the spore. The first septum forms in the center, dividing the spore into two equal cells. A septum is then laid down in the center of each of these cells giving four equal cells and three septa. This process continues until 16 cells are separated by 15 septa. Septation begins when the spore has attained nearly its full length. Occasionally some cells fail to divide. This leaves the spore with less than 15 septa and a few abnormally long cells which indicate the places at which the failures have occurred. Sometimes a few cells divide after the usual divisions have been completed. The spore then has more than 15 septa and the points at which the extra divisions have occurred are apparent from the presence of abnormally short cells (see FIG. 3, *b* AND *c*). In some of Durand's collections (Nos. *333*, *3098*, *9620*) spores with 16 to 20 septa were frequently observed.

In *T. velutipes*, *T. Wrightii*, and *T. hirsutum f. variabile* the method of septation seems to be fundamentally different. The first septum forms in the center of the lengthened spore, but following it four septa are formed, apparently simultaneously, dividing these two cells into three cells each and giving the spore 6 cells and 5 septa. All five of these septa are usually equally spaced, but sometimes certain of the resulting cells are longer than others. The next division which is the last (except occasionally in the case of *T. hirsutum f. variabile*) divides the 6 cells equally into 12 with 11 septa, this seeming to be the usual number just as 15 is normal for *T. hirsutum*. Sometimes one or more of the last divisions fail to take place, especially if the cells formed by the second division are unequal. Spores with 8, 9, or 10 septa instead of 11 thus result. The points at which septa have failed to form are consequently not always as apparent here as in *T. hirsutum* (see FIGS. 2 AND 4). In *T. hirsutum f. variabile* after the spore has become 11-septate extra divisions may occur giving the spore more than 11 septa though as yet no 15-septate spores have been observed (see FIG. 3*d*, *e*, AND *f*). It would be interesting to determine in stained material whether these two different types of septation are correlated with fundamentally different nuclear histories. It would seem that the absolute number of septa in the spore is

not of primary significance. Though 15-septate spores have not been observed in *T. hirsutum f. variabile* the discovery of such spores would not result in the merging of this form with the typical *T. hirsutum*. The two would still be separable in that the character of the septation is essentially different in the two cases. This fact has made it evident in the minds of the writers that *f. variabile* should be given specific rank, but they hesitate to take this step until a thorough cytologic investigation has confirmed their observations as to the difference in the development of septation. If these observations are confirmed, the species of *Trichoglossum* probably should be rearranged so that *T. hirsutum*, *T. confusum*, and *T. Walteri* will fall in one group having spores typically 7- and 15-septate, while *T. velutipes*, *T. Wrightii*, *T. hirsutum f. variabile* (raised to specific rank), and *T. Farlowi* will fall in a second group having spores typically 5- and 11-septate. A similar revision may also be desirable in related genera of the family.

In size and shape the spores of *f. variabile* are very similar to those of typical *T. hirsutum*. In both, the upper end of the spore is more pointed than in *T. velutipes*, and tapering takes place in both directions from near the center of the spore, the distinction between the two ends being in consequence less evident. This may have been the basis of Durand's opinion that "the spores of *T. velutipes* are broader and stouter than those of *T. hirsutum*." However, both in *T. hirsutum* and *f. variabile* atypical spores approach the spore shape of *T. velutipes*. Though typical spores are distinctive in these three forms it is not always possible to determine on the basis of spore shape alone the species to which an isolated spore belongs.

A single collection of *Trichoglossum*, made by the junior author at Labrador Lake near Apulia, New York, in 1924, has proved to be distinct from any of the forms discussed by Durand. The spores are normally 15-septate as in *T. hirsutum*, but the asci are constantly 4-spored. In spore shape the form resembles *T. hirsutum*. The collection is especially interesting in that it brings to light a form bearing a relationship to *T. hirsutum* similar to that of *T. velutipes* to *T. Wrightii*.

If the Geoglossaceae be considered from the standpoint of

phylogeny it seems probable that the type of spore septation constitutes a more ancient character than does the number of spores in the ascus. In *Trichoglossum* it seems to afford the most natural basis for the primary separation of the group of species comprising the genus.

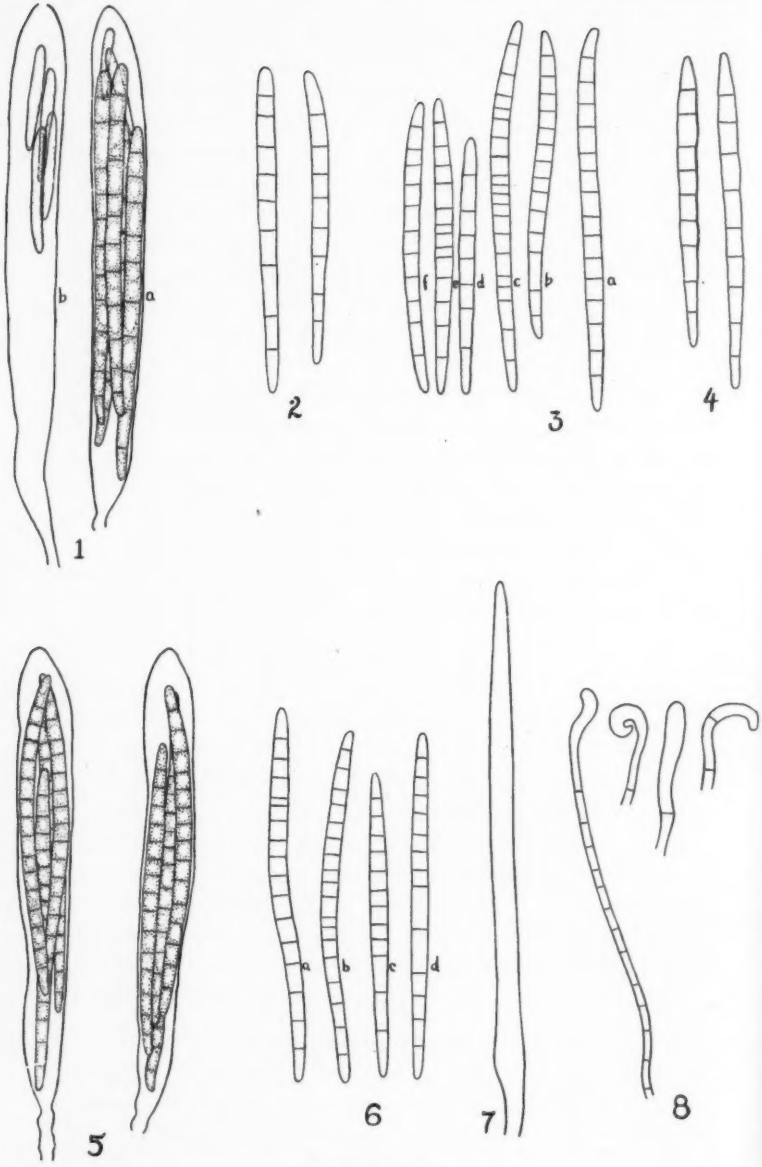
The new form then is to be regarded as most closely related to *T. hirsutum*. That it arose from this species or from a common ancestor with 8-spored asci is suggested by the fact that in it the young ascus contains the fundaments of 8 spores. Four of these develop into spores. The other four elongate somewhat, but appear finally as no more than indistinct protoplasmic strands.

A similar condition exists in the other 4-spored species, *T. velutipes*. There, in certain collections (*e.g.* Durand Herbarium Nos. *1297* and *1521*), the situation is exactly the same. In others (*e.g.* Durand Herbarium Nos. *788* and *1920*) four short unicellular, yellowish spores with evident walls and contents are found at maturity accompanying the 4 long, brown, pluri-septate spores typical of the species (FIG. 1). In one collection (Durand Herbarium No. *807*) the four small spores are hyaline and often uni-septate.

Following Durand's precedent in recognizing *T. velutipes* as distinct from *T. Wrightii* on the basis of the 4-spored nature of its asci it seems logical to consider the new form as a distinct species separable from *T. hirsutum* on the same basis. It also differs from *T. hirsutum* in having shorter asci. The shape of the spores and their 15-septate character separate it from *T. velutipes*. Though spores with a greater or less number of septa than 15 sometimes occur they correspond in their variation to the condition existing in *T. hirsutum* (FIG. 6). In both species spores with less than 15 septa are to be considered as abnormal. The collection of the new species comprises five ascomata. The following diagnosis is based on these.

Trichoglossum tetrasporum sp. nov.

Ascomata black, 3–8 cm. high; ascigerous portion elliptical to sub-rotund, not more than 1/5 the total length of the entire ascoma, more or less compressed, rounded above, rather sharply delimited from the stem; stem terete, rather flexuous, 1–2 mm.



TRICHOGLOSSUM

thick, equal, black, velvety; asci clavate, apically narrowed, 175–220 × 20–25 μ; spores 4 in a fascicle, brown, cylindrical-clavate, broadest above the middle, tapering each way to sub-obtuse ends, normally 15-septate at maturity, 110–160 × 6–7 μ (mostly 125–150); paraphyses smoky brown, cylindrical, septate; tips somewhat curved, slightly thickened, 3 μ thick below to 7 μ thick above. Setae black, projecting slightly beyond the hymenium.

Labrador Lake near Apulia, New York. Fitzpatrick, 1924.

Type deposited in Plant Pathology Herbarium, Cornell University, Ithaca, N. Y., as No. *17779*.

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EXPLANATION OF PLATE

The drawings were made by the senior writer. They were outlined with the aid of a camera lucida and reduced to one half their original diameter in reproduction. As reproduced the figures represent throughout a magnification of approximately 300 diameters.

Fig. 1. *Trichoglossum velutipes*. (*a*) Mature ascus containing four large, brown, pluriseptate spores accompanied by four smaller, yellowish unicellular spores, two of which are hidden from view. (*b*) Another ascus after dehiscence; the four smaller spores still in the ascus.

Fig. 2. *T. velutipes*. Typical spores.

Fig. 3. (*a, b, c*) *T. hirsutum*. (*a*) Normal 15-septate spore. (*b*) A 14-septate spore; the position of the missing septum evident. (*c*) A 19-septate spore; counting from the upper end the fourth, ninth, eleventh, and sixteenth septa are extra. (*d, e, f*) *T. hirsutum f. variabile*. (*d*) A 7-septate spore in which the two cells at each end have failed to undergo the final division. (*e*) A 13-septate spore in which an extra division has occurred in the two center cells. (*f*) An 11-septate spore, normal for the form.

Fig. 4. *T. Wrightii*. Typical spores.

Fig. 5. *T. tetrasporum*. Asci containing normal spores.

Fig. 6. *T. tetrasporum*. Atypical spores. (*a, b*) with extra septa, (*c, d*) with missing septa.

Fig. 7. *T. tetrasporum*. A cystidium (seta) taken from the ascigerous portion of the ascoma.

Fig. 8. *T. tetrasporum*. Showing variation in paraphyses.

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A NEW PORTO RICAN SPECIES OF ACREMONIELLA

RAFFAELE CIFERRI AND BAILEY K. ASHFORD

(WITH 2 TEXT FIGURES)

ORIGIN OF STRAIN: A saprophyte of the human skin.

COLLECTION NUMBER: *1557*[2] Ashford.

CULTURAL AND MORPHOLOGICAL CHARACTERISTICS: Cultivated in favorable media, such as Sabouraud's proof-agar, the growth at laboratory temperature, 26° to 34° C., is quite rapid. The colony is white or whitish, at the beginning composed of creeping hyphae which extend superficially giving the appearance of an irregular cobweb. The surface, however, is not uniform but presents here and there some cottony mycelial tufts of the same color.

After four or five days when the colony has extended all over the surface of the agar, there are formed in the upper layer of the medium a series of dark olive areas, which run from dark to lighter shades, which are irregular, and which give to the whole colony a gray color which is not uniform.

As it increases in age the colony takes on a deeper color from a greater predominance of the olive-tint of the surface and on account of a less regular distribution of the white or whitish sterile hyphae on the surface (FIG. 1).

These morphological characteristics are constantly sustained in the various culture media tested, only varying in the thickness of the superficial white duvet which can pass from an almost compact cottony or thick wooly appearance to a cobweb consistence, with scanty and almost isolated superficial hyphae. The same can be said of the color of the duvet, at first pure white and later often becoming whitish-gray to gray, or even deepening to an ochraceous tint. The characteristics of the blackish-green coat on the surface of the agar, however, do not vary. Even the substratum of the culture, here and there, has a dark tinge.

The morphology of this fungus is relatively simple: up to the

third day after inoculation of the media there are no fructifications, the hyphae consisting of two types. The deeper hyphae, completely serpentine, are subhyaline, very frequently septate and normally narrowed at the site of the septa. Generally the septa are very close together and the narrowing above-mentioned gives to the hypha a toruloid appearance, although it is very

FIG. 1. Colony of *Acremoniella olivaespora*, on Sabouraud's proof aga ten days old. ¾ natural size.

irregular (FIG. 2, *b*). Generally the protoplasm cannot be recognized by the eye and the membranes are thick and clearly distinguished. The caliber of these hyphae, although very variable, normally reaches a size three or four times that of the aerial hyphae (15 or more microns). These last, which are more superficial and form the cottony and cobweb duvet, sprout from the first variety in the substratum of which they are generally lateral branches. They are sub-erect, less frequently septate than the first form and of a lighter color. In fact, they are almost hyaline with a more delicate external membrane and generally a more brilliant protoplasm. The hyphae are more abundantly branched but they have no characteristics that are worthy of special mention. Their caliber, although variable, oscillates between 3 and 5 microns and, the most delicate, between 1.0 and 2.0 (FIG. 2, *a*).

From these sterile hyphae are derived some short fertile ones, which are generally lateral, simple, always creeping, usually curved and rarely straight, subhyaline, and function as conidiophores. These conidiophores have approximately the same caliber as the hyphae from which they spring (1.0 to 3.0 microns).

FIG. 2. *Acremoniella olivaespora*, nova sp. (a) Conidia, conidiophores, and hyphae, (b) Deep hyphae (c) Beginning of the formation of conidia (d), Isolated conidia, (e) Germinating conidia, (f) Insertion of conidia on the conidiophores. Sketched from camera lucida, object. 4, ocular 25, B. and L. except a part of (c) sketched with ocular 10.

The length is very variable, however, oscillating between 20 and 30 microns or more, but they can be so short that they simulate sessile conidia, that is to say, they may spring apparently directly from the primary hyphae (FIG. 2, *a*). All these short hyphae are fertile and each one produces a conidium which is entirely acrogenous and solitary. At the free extremity of the conidiophore a more or less spherical head is formed, subhyaline at first, but almost immediately becoming dark and finally black and opaque, as it approaches its ultimate size (FIG. 2, *f*). The insertion of the conidiophores on a sterile hypha, and their number and disposition, is very variable. Normally the conidiophores are well separated the one from the other in a sterile hypha, but frequently they become much more approximated, although they never spring from the same point, as in some cases it may appear at first sight. There are occasions where a hypha which is giving birth to conidiophores may itself bear at its termination a spore; or a hypha of this category may terminate in a fork each branch of which may bear a conidium; or there may be even a double branched terminal in which one branch may carry a conidium and the other may continue as a mycelial element.

The conidiophore fails to present anything worthy of special mention either at the base or the tip; nevertheless, the tip may be slightly swollen although never really spherical.

The appearance of a fertile hypha with its conidiophores and conidia hanging therefrom, black and opaque, reminds one a good deal of a branch of an olive-tree with ripe, black olives. On account of this similarity the name of the species has been given (Fig. 2, *a*).

The conidia, usually apical and solitary, may be double and, on extremely rare occasions, triple. These last exceptions are, evidently, abnormalities due to the exceptional conditions which the medium may offer. On direct observation of a culture in a Petri dish, groups of conidia seem to be very frequent, but in reality this disposition is purely an illusion and is due to overlaying of several fructifying conidiophores, each on a different plane (FIG. 2, *c*). The conidia do not easily separate from the conidiophore as a rule, even when they are completely mature;

in our studies of development we have frequently seen the conidium germinate while still attached to its conidiophore.

The conidia are quite polymorphous (FIG. 2, *d*); however, the dominant form varies between spherical and elliptical if one looks at them from the front. Laterally, the shape frequently appears asymmetrical, that is to say, with one side convex and the other flat or concave. The color is absolutely dead-black, carbonaceous, and opaque, so it is impossible to distinguish the episporium. The size is from 15 to 26 microns or 10 to 18.5 × 14 to 26 microns, the average size falling between 18 and 22 microns.

The conidia germinate with considerable difficulty in hanging drop and frequently even while they are hanging from a conidiophore. They form one or, rarely, more germinative tubes which lengthen indefinitely, branching repeatedly and irregularly without being able to produce anything but mycelium (FIG. 2, *e*).

SYSTEMATIC POSITION

This fungus from its black spores and sub-hyaline, at times smoky, hyphae, with solitary and apical conidia, should be placed among the Dematiaceae Macronemeae Monotosporeae, and from its abundant sterile hyphae in the genus *Acremoniella* Saccardo (**3**, page 302). This genus has its corresponding prototype among the Moniliaceae in the genus *Acremonium* Link. If we consider the genus *Acremoniella* as defined in its original sense, our strain can be easily included therein. As a matter of fact, as far as the conidiophores are concerned, Saccardo writes " . . . ramulos sporigeros simplices breviusculos hinc inde exserentes . . . " without defining whether the conidiophores are erect or prostrate. On the contrary, Ferraris (**1**, page 268) writes: "conidiophora erecta . . . " while Lindau (**2**, page 675) affirms almost literally the generic diagnosis of Saccardo. If we accept the genus *Acremoniella* with the addition, rather than the amendment of Ferraris, our strain, which has conidiophores that are always beyond question prostrate, could not be included strictly among the *Acremoniella*, while if we accept the first definition the contrary would be the case. In reality the addition of Ferraris can be justified by informing ourselves of

the type species of *Acremoniella*, *A. atra* (Corda) Sacc., which has, according to the Sylloge Fungorum, "conidiophoros assurgentes." But this is not so or this characteristic is not expressed in the other six species and one variety of the Sylloge, and also in two of the three species registered among the flora of Ferraris.

We believe, therefore, that it would be better to return to the original signification of Saccardo's genus and add to the diagnosis: conidiophores erect or prostrate, dividing *Acremoniella* into two subgenera, **Eu-Acremoniella** *nobis*, with conidiophores erect, and **Acremoniellopsis** *nobis*, with prostrate conidiophores. Our species should therefore be placed in this subgenus where they will be alone, as we have no information as yet that others should join them. However, it is not impossible that a comparative study of the species of *Acremoniella* in culture, under different conditions and media, might modify to an extent the subdivision of the genus or cause a redistribution of the species among the two subgenera.

Therefore we present the following new species:

Acremoniella (*Acremoniellopsis*) **olivaespora** Ciferri & Ashford, sp. nov.

Grayish-white colony, from the texture of a cobweb to cottony, afterward of a dull olive-brown color; old sterile smoky hyphae, of heavy caliber (15 mic. or over), highly septate and almost moniliform, prostrate; young hyphae sub-hyaline, highly branched, with a diameter of from 1.0 to 5.0 microns, sub-erect; short conidiophores (30 or more microns), lateral, simple and prostrate, of uniform caliber (1.0 to 3.0 microns), never branched, monosporous; conidia continuous, solitary, or rarely double or triple in a group, apical, spherical to elliptical, in profile hemispherical or semilunar, dissymmetrical or not, not easily dislodged, black, carbonaceous or opaque, 12 to 18 by 14 to 26 microns or 15 to 26 microns in diameter, generally 18 to 22, which germinate by producing one or rarely two germinative tubes, even without separating from the conidiophores.

Habitat: The human skin, San Juan, Porto Rico (legit. Bailey K. Ashford, September, 1928).

SUMMARY

A study was made of a new species of the genus *Acremoniella* (*A. olivaespora*) and some observations were made on this genus which was divided into two subgenera.

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NEW SPECIES OF LICHENS FROM PORTO RICO. III.[1]

A. ZAHLBRUCKNER

[As stated in the first paper of this series, 110 specimens of the Porto Rican lichens were submitted to Doctor Zahlbruckner for study. The new species described below are the result of his work on these specimens.]

1. **Thelidium leucoplacum** Zahlbr. (n. sp.)

Thallus epilithicus, tenuis, tartareus, late expansus, e maculis pluribus confluentibus formatus, griseo-albus, opacus, minute areolatus, areolis ad 0.1 mm. latis, planis, angulosis, rimis tenuissimus separatis, soridiis et isidiis nullis, in margine passim linea tenui nigra cinctus; gonidia ad Cystococcum pertenentia. Apothecia plus minus dispersa, adpresso-sessilia, minuta, 0.1–0.15 mm. lata, nigra, opaca, a thallo libera, convexa; excipulum dimidiatum, fusco-nigrum, ostioilo minuto pertusum; hymenium gelatinosum, J dilute cupreum; paraphyses mox confluentes; asci ovali-clavati, 8 spori; sporae in ascis biseriales, decolores, ellipsoideae vel ovales, rectae, uniseptatae, septo tenui, 14–18 × 8–9 mic.

On rocks on an open hill-side near Yauco, Fink *1399*.

2. **Microthelia socialis** Zahlbr. (n. sp.)

Thallus endophloeodes, extus macula roseo-albido, nitidulo indicatus, late expansus, laevigatus, continuus vel hinc inde irregulariter fissus, sorediis et isidiis nullis, in margine linea tenui umbroso cinctus; gonidia ad Trentepohliam pertinent. Apothecia minuta, 0.15–0.2 mm. lata, adpresso-sessilia, convexa, primum leviter velata, mox nuda, nigra, nitida, rare dispersa, utplurimum seriatim disposita vel aggregata, poro terminali, vix conspicuo; excipulum fusco-nigrum vel obscura fuscum, haud fragile, dimidiatum; hymenium decolor, J lutescens; paraphyses crebrae, ramosae et intricatae; asci late obpyriformes, ad apicem rotundato-retusati et membrana bene incrassata cincti, 8 spori;

[1] No. II of this series was published by E. A. Vainio in MYCOLOGIA **21**: 33–40. 1929. The present was transmitted through the Botany Department of Miami University, Oxford, Ohio, by Joyce Hedrick.

sporae in ascis bi-triseriales, olivaceo-fuscae, oblongo-ellipsoideae, rectae, uniseptatae, cellula superiore parum breviore et latiore, septo tenui, ad septum leviter constrictae, 15–17 × 6 mic.

On trees on an exposed hill-top near Yauco, Fink *1459a*.

3. **Pyrenula psoriformis** Zahlbr. (n. sp.)

Thallus epiphloeodes, crustaceus, tenuis, alutaceo-fuscus vel fuscus, passim alutaceus, nitidus, areolatus, areolis polygonis, 0.2–0.6 mm. latis, plus minus convexis, fissuris tenuibus separatis vel hinc inde, imprimis ambitum thalli versus, subsquamulosis, superne minute granulosis et lineis latiusculis, nigris, irregularibus sat dense percursis; gonidia ad Trentepohliam pertinentia. Apothecia sessilia, nigra, nitida, convexa, ad 1 mm. lata, ad basin leviter abrupta vel passim sensim in thallum angustata, poro terminali, leviter impresso pertusa; excipulum extus a thallo chondroideo, crassiusculo, ad ambitum nigro, intus decolores vel rufescente, ex hyphis intricatis et gelatinose conglutinatis formato, in parte basali gonidia chroolepoidea includente obductum, fuligineum, integrum, extrorsum versus ad basin breviter acutato-elongatum; hymenium decolor, purum, J lutescens; paraphyses filiformes, simplices, sat liberae; asci cylindrico-clavati, ad apicem rotundati, 8 spori; sporae in ascis uniseriales, fuscae (primum fumosae), oblongo-ellipsoideae, rectae, 4 loculares, loculis late lentiformibus, fere aequalibus, 12–16 × 5–6 mic.

On trees in woods near Yauco, Fink *1449*.

4. **Anthracothecium maculare** Zahlbr. (n. sp.)

Thallus epiphloeodes, maculas rotundatas, bene limitatas formans dispersas vel hinc inde confluentes, crassiusculus, usque ad 1 mm. altus, ochraceo-isabellinus, nitidus, KHO plus $CaCl_2O_2$ aurantiacus, laevigatus et continuus, leviter inaequalis, sorediis et isidiis nullis, in margine linea obscuriore non cinctus; gonidia ad Trentepohliam pertinentia; medulla dilute flavens. Apothecia thallo immersa, parva, ad 0.3 mm. lata, tantum vertice nigro, ad 1.5 mm. lato et convexulo prominula, demum elabentia et foveolas nigricantes relinquentia; excipulum globosum, integrum, fuligineum, tenue, hymenium decolor, non inspersus, J lutescens; paraphyses filiformes, simplices vel partim ramosae, eseptatae; asci ovali-clavati, mox diffluentes, 8 spori; sporae in ascis triseriales, e fumoso demum rufescentifuscae, ellipsoidea, rectae, murales, cellulis in seriebus superpositis 8, in seriebus horizontalibus 1–3, 34–45 × 14–16 mic. Affinis est *A. mucoso* (Vainio) sed apothecia minora, sporae non monostichae et thallus aliter coloratus.

On shrubs on an exposed hill-top near Yauco, Fink *1578*.

5. **Dermatina Finkii** Zahlbr. (n. sp.)

Thallus pro maxima parte epiphloeodes, maculosus, isabellinus, opacus, KHO luteus, demum aurantiaco-sordidescens, inaequalis, subverruculosus vel passim sublaevigatus, isidiis et sorediis non praeditus, in margine linea obscuriore non cinctus, fere homoeomericus; gonidiis cystococcoideis, globosis, laete viridibus, 9–10 mic. latis; hyphae thalli non amyloideae. Apothecia sessilia, nigra, opaca, rotundata vel irregularia, rarius oblonga, 0.4–1 mm. longa, modice convexa, immarginata; excipulum crassiusculum, integrum, fuligineum, e basi columellas varie longas, hymenio parum breviores vel hymenium omnino percurrentes emittens; hymenium purum, J lutescens; paraphyses ramosae et intricatae, parum distincte limitatae; asci late ellipsoidei, 8 spori; sporae in ascis biseriales, decolores, ellipsoideae, utrinque rotundati, in medio constrictae, murales, cellulis subcubicis, leptodermaticis, in seriebus superpositis 8, in seriebus horizontalibus 1–4, halone non cinctae, 31–39 × 12–17 mic.

On posts in an open field near Aibonito, Fink *2015*.

6. **Diploschistes straminescens** Zahlbr. (n. sp.)

Thallus tenuis, substrato arcte adnatus, subtartareus, pallide stramineus vel ochraceo-albidus, opacus, KHO- vel dilutius flavescens, $CaCl_2O_2$-, primum continuus, demum irregulariter et passim grosse subareolatim fissus, fissuris tenuibus, superne inaequalis, sorediis et isidiis nullis; medulla alba, KHO-, $CaCl_2O_2$ rosacea, J rufescenti-violacea. Apothecia adpresso-sessilia, dispersa vel approximata, rotunda, ad basin retusae vel leviter constricta, usque 1 mm. lata; discus e concaviusculo planus, niger, glaucescenti-pruinosus, a vertica excipuli tenui, nigro et integri circumdatus; margo thallinus sat angustus, subinteger, discum non vel vix superans; excipulum fusco-nigrum, integrum, modice incrassatum, extus a thallo vestitum; hymenium 125–140 mic. altum, superne fuscum et pulverulentum, caetaerum fere decolor, J lutescens; paraphyses simplices, filiformes, eseptatae, ad apicem non clavatae; asci variaeformes, subcylindrici, oblongi vel ovales, 6–8 spori; sporae in ascis subuniseriales, olivaceae vel fuscae, ovales, in uno apice rotundatae, in altero apice plus minus attentuatae, murales, septis horizontalibus 5, verticalibus 1–2, 24–26 × 8–10 mic.

On clay banks along an open roadside near Mayaguez, Fink *1008* and *1016*.

7. **Calenia albonigra** Zahlbr. (n. sp.)

Thallus epiphyllus, maculas irregulares, plus minus confluentes, mediocres formans, substratum arcte obducens, glaucescenti-

albidus, opacus KHO et $CaCl_2O_2$ non mutatus, continuus, in ambitum in plagas minores et dispersas dissolutus, laevigatus, sorediis et isidiis non instructus, in margine linea obscuriore non cinctus, fere homoemericus, gonidiis cystococcoideis, late viridibus; hyphae thalli non amyloideae. Apothecia minuta, ad 0.2 mm. lata, lecanorina, sessilia, rotunda, ad basin non angustata, plus minus dispersa; discus angustus, niger, haud nitens, demum convexiusculusi margo thallinus discum annulatim cingens, albus, integer, demum plus minus depressus; hymenium superne dilute umbrinum vel subcinnamomeum, non inspersum, caeterum vitreo-pellucidum, purum, J coerulum (imprimis asci), strato gonidiali non superpositum; paraphyses gelatinose conglutinatae, parum distinctae, ramosae, eseptatae, non clavatae; asci oblongi vel ellipsoideo-clavati, superne rotundati et membrana bene incrassata cincti, 8 spori; sporae in ascis biseriales, oblongae vel ellipsoideo-oblongae, utrinque rotundatae, rectae vel subrectae, uniseptatae, septo tenui, ad septum non constrictae, membrana tenui cinctae, 7.5–8.5 × 3 mic.

On leaves near Manati, Fink *2121*.

8. **Gyalecta** (sect. *Secoliga*) **rubella** Zahlbr. (n. sp.)

Thallus epilithicus, tenuis, substratum arcte obducens, subtartareus, virenti-argillaceus, fere opacus, tenuissime diffractus, in margine linea obscuriore non cinctus, sorediis et isidiis destitutus; gonidia ad Trentepohliam pertinentia, cellulis ovalibus vel rotundatis, membrana ad 5 mic. crassa cinctus. Apothecia habitu biatorina, sessilia, ad basin leviter constricta, passim sat crebra, parva, 0.3–0.7 mm. lata, carneo-rufescentia, madefacta laetius colorata, opaca, concaviuscula vel plana; margo thallinus tenuis, integer, demum depressus; excipulum dimidiatum, lutescenti-fuscescens, subchondroideum; hymenium sat angustum, 78–88 mic. altum, superne anguste umbrino-obscuratum, caeterum decolor et purum, J coeruleo-sordidum; paraphyses filiformes, simplices, eseptatae, ad apicem non clavatae, conglutinatae; asci oblongi-clavati, ad apicem bene rotundati vel subretusati, recti vel curvulae, 8 spori; sporae in ascis 2–3 seriales, decolores, subdactyloideo- vel subfusiformi-ellipsoideae, rectae vel curvulae, utrinque acutatae vel in uno apice paulum latiores, 6 loculares, septis tenuibus, membrana tenui cinctae, 17–20 × 5 mic.

On rocks in a shady field near Naranjito, Fink *185*.

9. **Pyrenopsis portoricensis** Zahlbr. (n. sp.)

Thallus epilithicus, expansas, tenuis, uniformis, fusco-niger, opacus, siccus minute areolatus, madefactus magis continuus et

sub-byssaceo-inaequalis, in margine haud bene limitatus, sorediis et isidiis nullis, fere homoeomericus, gonidiis glaucescentibus, vagina purpurascente, KHO violascente, cinctus. Apothecia dispersa vel approximata, ex innato sessilia, minuta, usque 0.5 mm. lata, vulgo tamen minora, nigra, convexula, margine vix conspicuo; hymenium superne anguste olivascens, non inspersum, caeterum decolor, purum, pellucidum, 95–100 mic. altum, J aeruginosa-sordidescens; paraphyses capillares, conglutinatae, sed distincte limitatae, simplices, eseptatae, non clavatae; asci ovali-clavati vel obpyriformis, ad apicem rotundati et membrana incrassata cincti, 8 spori; sporae in ascis 2–3 seriales, decolores, simplices, ellipsoideae, rectae, membrana tenui obductae, 9–10 × 3–3.5 mic.

On rocks in open fields near Rio Grande, Fink *690;* Mayaguez, Fink *1257, 1278;* and Aibonito, Fink *1950.*

10. **Psorotichia calcigena** Zahlbr. (n. sp.)

Thallus endolithicus, extus macula sat expansa, albida vel sordide cinerascente, opaca indicatus, continuus, in margine linea distincta non cinctus, plectenchymaticus, ex hyphis densis, leptodermaticis formata; stratum gonidiale in parte superiore thalli situm, e glomerulis approximatis gonidiorum formatum, continuum, cellulae gonidiorum 2–4–(8) in gelatina communi immersae, dilute coerulescenti-glaucescenzes, 5–6 mic. latae; gelatina in parte marginali thalli fuscescens. Apothecia crebra, dispersa vel parum approximata, sessilia, nigra, opaca, minuta, circa 0.5 mm. lata, urceolata vel concava, margine proprio integro, prominulo et crassiusculo cincta; excipulum dimidiatum, rufescenti-fuscum; hypothecium obscure rufo-fuscum, crassiusculum; hymenium superne rufescenti-fuscescens, caeterum dilute fuscescens, purum, 75–80 mic. altum, J dilute coerulescens et demum lutescenti-fuscescens; paraphyses filiformes, simplices, eseptatae, ad apicem parum latiores, gelatinose conglutinatae; asci oblongo-ellipsoidei, inferne angustati, 8 spori; sporae in ascis biseriales, decolores, simplices, oblongo-ellipsoideae, utrinque rotundatae vel modice angustatae, rectae, membrana pertenui cinctae, 10–11 × 5–6 mic., contentu inaequali.

On rocks in an open field near Yauco, Fink *1413.*

11. **Thyrea myriocarpa** Zahlbr. (n. sp.)

Thallus monophyllus, squamosus, squamis umbilicatis, dispersis vel approximatis, rotundis vel rotundatis, 2–4 mm. latis, planis vel planiusculis, superne modice inaequalibus, in margine subintegris vel minute crenulatis, ad ambitum passim leviter

elevatis, nigris, opacis, madefactis aeruginoso-nigricantibus, epruinosis, subtus nigris, increbre verruculosis, homoeomericus, ex hyphis laxiusculis, tenuibus, reticulatim-ramosis, distincte non septatis et ex goniodis ad Xanthocapsam pertinentibus, ad ambitum thalli membrana ochraceo-fuscescente cinctis formatus, cellulae gonidiorum aeruginosae, usque 18 mic. latae. Apothecia lecanorina, numerosa in quavi squama thalli, valde minuta 0.06–0.1 mm. lata, semiimmersa; discus obscure fuscus, opacus, non pruinosus; margo thallinus crassiusculus, primum supra discum connivens, demum modice divergens; excipulum parum distinctum, in apotheciis juvenilibus integrum, decolor; hypothecium angustum, decolor; hymenium superne ochraceo-fuscescens, non inspersum, caeterum decolor et purum; paraphyses strictiusculae, capillari-filiformes, eseptatae, simplices vel parce ramosae, non capitatae; asci oblongo-clavati, 8 spori; sporae decolores, simplices, ovales, bene evolutae non visae.

On rocks in an open field near Manati, Fink *2053*.

12. **Leprocollema Finkii** Zahlbr. (n. sp.)

Thallus epilithicus, crustaceus, uniformis, tenuis, usque 1 mm. crassus, siccus olivaceo-nigrescens vel olivaceo-aeruginosus, opacus, subverruculoso-areolatis, areolis 0.2–0.4 mm. latis, convexulis vel planiusculis, primum dispersis, demum confluentibus, hypothallus distinctus non evolutus, homoeomericus, gonidiis nostocaceis, glomeratis (glomerulis rotundis), copiosis, hyphis increbis circumdatis. Apothecia primum immersa, demum adpresso-sessilia, biatorina, dispersa, rotunda, usque 1 mm. lata, primum leviter urceolata, demum concaviuscula; margo proprius prominulus, integer, obtusiusculus, demum angustatus, disco concolor vel demum parum pallidior; discus rufescenti-fuscescens, opacus, epruinosus; hypothecium lutescens, molle, ex hyphis intricus formatum; hymenium superne anguste rufescens, caeterum decolor et purum, 100–120 mic. altum, J e coeruleo cupreo-rufescens; paraphyses capillares, conglutinatae, simplices, eseptatae, non clavatae; asci clavati vel oblongo-clavati, plerumque curvuli, superne rotundati, 8 spori; sporae in ascis uni-vel biseriales, decolores, simplices, ellipsoideae vel ovali-ellipsoideae, utrinque rotundatae, rectae, membrana tenui cinctae, primum guttula oleosa unica et majuscula impletae, 18–20 × 8–9 mic.

On rocks on an exposed hill-top near Yauco, Fink *1385*, *1396;* and near Rio Piedras, Fink *616*.

13. **Lecidea** (sect. *Biatora*) **camporum** Zahlbr. (n. sp.)

Thallus epilithicus, tenuis, subtartareus, substratum arcte obducens, alutaceo-sordidus, opacus, KHO parum lutescens,

$CaCl_2O_2$ non tinctus, sorediis et isidiis destitutus; medulla tenuis, alba, ex hyphis non amylaceis formata; gonidia cystococcoidea, 9–11 mic. lata, glomerata. Apothecia plus minus dispersa vel passim confluentia, sessilia, rotunda, parva, 0.4–0.8 mm. lata, livido-fusca vel nigricantia, opaca, convexa, margine jam in juventute depresso; excipulum dimidiatum, fusco-nigricans, ex hyphis tenuibus, subradiantibus formatum; hymenium 65–75 mic. altum, pallide sordidum, superne parum obscurius, J e coeruleo aeruginoso-obscuratum; hypothecium crassiusculum, obscure fuscum vel fere nigricans, ab hymenio non distincte limitatum; paraphyses filiformes, simplices, eseptatae, non clavatae, conglutinatae; asci ellipsoideo-clavati, superne rotundati, recti, 8 spori; sporae in ascis plus minus biseriales, simplices, decolores, ellipsoideae vel ovali-ellipsoideae, rectae, membrana tenui cinctae, 7–7.5 × 4 mic.

On rocks in an open field near Yauco, Fink *1677*.

14. **Lecidea** (sect. *Biatora*) **piperis** (Sprgl.) Nyl. **saxigena** Zahlbr. (n. var.)

Thallus argillaceus, opacus KHO vix mutatus, continuus, passim laevigatus, passim inaequalis vel subplicatus, sorediis et isidiis nullis; medulla coccinea vel passim albida, J viololascens. Apothecia sessilia, dispersa, approximata vel hinc inde seriata, ad basin constricta, 0.7–0.8 mm. lata, e plano convexiuscula, carneo-argillacea, opaca; margo proprius integer, madefactus nigricans, latiusculus, discum haud superans, extus strato rubicundo chondroideo, discum parum superante obductus, intus coccineo-kermesinus, J violascens, ex hyphis tenuibus, radiantibus, conglutinatis formatus; excipulum integrum, fusconigrum, infra hymenium paulum crassius, usque ad verticem hymenii assurgens; hymenium decolor, pellucidum, purum, 75–80 mic. altum, superne fere decolor; paraphyses filiformes, strictae, ad 2 mic. crassae, conglutinatae, simplices, eseptatae, non clavatae; asci ellipsoideo-clavati, inferne breviter pedicillati, 8 spori; sporae in ascis biseriales vel subuniseriales, decolores, simplices, ellipsoideae vel sublongae, utrinque aequaliter rotundatae, rectae, membrana tenui cinctae, 12.5–14 × 7–7.5 mic.

On rocks in a shady field near Naranjito, Fink *191*.

15. **Lecidea** (sect. *Biatora*) **mayaguez** Zahlbr. (n. sp.)

Thallus crustaceus, uniformis, tartareus, tenuis maculas dispersas vel confluentes formans, stramineo-albidus vel passim dilute ferrugineus, opacus, KHO-, $CaCl_2O_2$-, KHO plus $CaCl_2O_2$ aurantiacus, granuloso- vel verruculoso-inaequalis, demum sub-

leprosus, sorediis et isidiis nullis, in margine linea obscuriore non cinctus; gonidia palmellaceae, dilute viridia, 7–8 mic. lata, glomerata; medulla alba. Apothecia biatorina, sessilia, dispersa, rotunda vel subirregularis, obscure rufo-fusca, opaca, primum urceolata, mox convexa et plus minus gibberulosa, margine mox depresso, integro; excipulum dimidiatum, fusco-fuligineum, KHO in rufescentem vergens; hymenium 200–210 mic. altum, superne anguste fuscum et tenuiter inspersum, caeterum fuscescens, KHO magis lutescens, passim fere decolor, purum, J e violaceo aeruginoso-fuscum; paraphyses capillares, strictae, conglutinatae, simplices, eseptatae, non clavatae; hypothecium pallide fuscum vel expallescens; asci hymenio subaequilongi, clavati, subrecti vel curvuli, superne rotundati et membrana bene incrassata cincti, 8 spori; sporae in ascis plus minus biseriales, decolores, simplices, ellipsoideae vel subovales, utrinque angustato-rotundatae, rectae, membrana tenui obductae, guttulis pluribus et parvis impletae, 15–17 × 5–7.5 mic.

On rocks in the open near Mayaguez, Fink *1100*.

16. **Lecidea** (sect. *Biatora*) **portoricana** Zahlbr. (n. sp.)

Thallus epilithicus, crustaceus, uniformis, tenuis, substratum arcte obducens, isabellinus, opacus, KHO aurantiacus, $CaCl_2O_2$-, continuus, parum inaequalis, sorediis et isidiis nullis, in margine bene limitatus, sed linea obscuriore non cinctus; medulla alba, hyphis non amyloideis; gonidia cystococcoidea. Apothecia biatorina, sessilia, rotunda, convexa, ad basin leviter constricta, dispersa, usque 1 mm. lata, hymenio demum elabente cupulam pallidam relinquentia; margo tenui discum modice superans, niger, integer vel subinteger; discus livido-rufescens, demum nigricans, concavus, epruinosus; excipulum ad latera hymenii ex hyphis dense conglutinatis, filiformibus et radiantibus formatum, ad verticem parum nigrescens, caeterum cinereum, dense inspersum, ad margine tenuiter fuscescens; hypothecium crassum, cinerascens; hymenium superne non inspersum, tenuiter olivaceo-fuscescens, caeterum decolor et purum, 75–80 mic. altum, J aeruginoso-coerulescens; paraphyses filiformes, simplices, eseptatae, haud capitatae, conglutinatae; asci ellipsoideo-clavati, ad basin breviter pedicellati, superne rotundati et membrana bene incrassata cincti, 8 spori; sporae in ascis biseriales vel subbiseriales, decolores, simplices, ellipsoideo-oblongae, utrinque rotundatae, rectae, rare curvulae, membrana tenui cinctae, 10–12 × 2.8–3 mic.

On rocks in the open near Naranjito, Fink *101*.

17. **Catillaria** (sect. *Eucatillaria*) **pannosa** Zahlbr. (n. sp.)

Thallus epiphloeodes, late expansus, crassus, 1–1.6 mm. altus, alutaceo-sulphureus, opacus, KHO flavens, KHO plus $CaCl_2O_2$ subaurantiacus, omnino isidiso-leprosus, sorediis non praeditus, irregulariter areolato-rimosus vel areolatus, in margine linea obscuriore non cinctus; stratum corticale fere decolor, tenue, ad 30 mic. crassum, ex hyphis parum intricatis, subhorizontalibus formatum; medulla alba, KHO-, $CaCl_2O_2$-; gonidia glomerata, glomerulis plus minus dispersis, cystococcoidea, 3–5 mic. lata. Apothecia lecideina, dispersa, 0.8–1.6 mm. lata, primum immersa, demum adpressa, thallum vix superantia, nigra, opaca, epruinosa, primum rotunda, margine tenui integro, non prominula cincta, demum subirregularia, fere arthonioidea, convexula et immarginata; excipulum violaceo-nigricans, KHO sordide purpureum, dimidiatum, infra hymenium modice inflexum, 60–70 mic. crassum, ex hyphis crassiusculis, leptodermaticis, radiantibus formatum, chondroideum; hypothecium crassum, nigricanti-violaceum; hymenium superne anguste nigricans, caeterum decolor vel passim violaceo-obscuratum, purum, 65–80 mic. altum, J cupreum; paraphyses filiformes, conglutinatae, simplices, ad apicem capitatae, eseptatae; asci oblongo-clavati, superne rotundati et membrana modice incrassata cincti, 8 spori; sporae in ascis biseriales, decolores, ellipsoideo-fusiformes, utrinque acutatae, rectae vel subrectae, biloculares, septo valde tenui, membrana tenui obvellatae, 14–16 × 4–6 mic.

On trees along an open roadside near Mayaguez, Fink *1097*.

18. **Bacidia** (sect. *Eubacidia*) **microphialoides** Zahlbr. (n. sp.)

Thallus epilithicus, crustaceus, uniformis, tenuis, substratum arcte obducens, argillaceus vel sordidescens, opacus, reagentiis solitis non tinctus, continuus, laevigatus, sorediis et isidiis nullis, in margine linea obscuriore non cinctus; gonidia cystococcoidea. Apothecia minuta, 0.2–0.4 mm. lata, sessilia, rotunda, ad basin parum constricta, convexa, dispersa vel approximata, lutescenti-carnea, opaca, margo thallo concolor, siccus depressus, madefactus aquosus, obscuratus et paulum turgescens; excipulum integrum, decolor, ex hyphis radiantibus et conglutinatis, leviter intricatis, subindistincte septatis formatum; hymenium angustum, 37–40 mic. altum, superne valde anguste pallide umbrinum, caeterum decolor et purum, J e coeruleo cupreo-rufescens; paraphyses strictae, filiformes, conglutinatae, eseptatae, modice clavatae; hypothecium lutescens, molle; asci crebri, clavati, ad apicem rotundati, 8 spori; sporae in ascis 3–4 seriales, decolores, fusiformi-aciculares, subrectae, in uno apice rotundatae, in

altero angustatae, demum indistincta 8 loculares, 24–27 × 1.5–1.8 mic.

On rocks in an open pasture near Mayaguez, Fink *1227*.

19. **Ramalina Finkii** Zahlbr. (n. sp.)

Thallus erectus, pumilus, 12–20 mm. altus, caespites densos formans, molliusculus, ochraceo-glaucescens vel subochraceus, opacus, KHO-, e basi increbre ramulosus, ramis applanatis, vulgo ad 2 mm. latis, demum hinc inde usque 4 mm. latis, ultimus linearibus, acutis, omnibus concavis vel subcanaliculatis et indistincte longitudinaliter nervosis, in superficie verruculis sorediosis, minutis, glaucescentibus increbre instructis; cortex angustus, fuscescens, haud inspersus, continuus; fasciae axis chondroideae cortici accumbentes, distantes, in sectione transversali alte convexa, semi-circulares vel fere circulares; medulla alba, stuppea, KHO-; gonidia cystococcoidea. Apothecia subterminalia, breviter et late pedicellata, 5–6 mm. lata, urceolata; discus rosaceus vel albidus, dense albopruinosus, concavus; margo subinteger; receptaculum extus foveolatum, marginibus foveolarum acutis; sporae oblongae, utrinque rotundatae, rectae vel subrectae, uniseptatae, 11–13 × 4 mic.

On trees and posts in open fields near Aibonito, Fink *1799*, *1878*.

20. **Usnea** (*Pachynea*) **Finkii** Zahlbr. (n. sp.)

Thallus elongatus, pendulus (in speciminibus visis usque 20 cm. longus), molliusculus, simplex vel rare ramo unice praeditus in parte superiore thalli affixo, rami primarii plus minus undulati, teretes, plures intricati, laeves, nudae, ochraceo-lutescentes, nitiduli, KHO flaventes, sorediis nullis, demum transversim fracti; rami secundarii sat densi, usque 18 mm. longi, subangulo recto fere assurgentes, teretes, sorediis minutis et convexis obsiti, ramuli ultimi elongati et spinuliformes; medulla myelophyphica densa, alba, KHO vix mutata vel demum leviter flavens; axis chondroidea crassa, fere totum latitudinem thalli occupans, pallida, subpellucida, KHO-, J-. Apothecia non visa. —Ex affinitatae *Usneae longissimae* Ach. ab ae jam colore et ramis secundariis iteratim ramosus differt.

On rocks in an open field near Aibonito, Fink *1956a*.

21. **Buellia** (sect. *Eubuellia*) **sensitiva** Zahlbr. (n. sp.)

Thallus epilithicus, crustaceus, uniformis, tenuis, ad 0.2 mm. crassus, tartareus, isabellinus vel lutuso-cinerascens, opacus, KHO optime sanguineus, $CaCl_2O_2$-, areolatus, areolis angulosis, parvis, 0.2–0.3 mm. latis, fissuris tenuibus et acutis separatis, primum planiusculis, demum convexiusculis, superne laevigatis,

isidiis et sorediis nullis, in margine linea tenui nigraque bene limitatus; gonidia cystococcoidea; medulla alba, J violacea. Apothecia sat crebra, nigra, opaca, rotunda, usque 0.8 mm. lata, mox convexa, a thallo passim spurie cincta, margine mox depresso; excipulum dimidiatum, nigrum; hypothecium crassum, fere semiglobosum, fusco-nigrum, versus hymenium anguste fuscum; hymenium superne anguste obscuratum, non inspersum, caeterum decolor et purum, 90–100 mic. altum, J violaceo-coeruleum; paraphyses filiformes, strictae, simplices, eseptatae, ad apicem parum lateriore, conglutinatae; asci oblongi vel ellipsoideo-oblongi, superne rotundati et membrana primum bene incrassata cincti, 8 spori; sporae in ascis biseriales, olivaceo-fuscae, variabiles, ellipsoideae vel ovales, rectae vel curvulae, ad apices bene rotundatae vel modice angustatae, ad septum non vel parum constrictae cellulis aequalibus vel parum inaequalibus, septo tenui, 12–18 × 6–6.5 mic.

On rocks in the open near Naranjito, Fink *102*.

22. **Buellia** (sect. *Eubuellia*) **naranjitana** Zahlbr. (n. sp.)

Thallus epilithicus, crustaceus, uniformis, late expansus, tenuis, cervinus vel cervino-cinerascens, opacus, KHO lutescens, $CaCl_2O_2$-, KHO plus $CaCl_2O_2$ subaurantiacus, continuus, laevigatus vel parum inaequalis, sorediis et isidiis destitutus, lineolis protothallinus, nigris, tenuibus subareolatim percursus, in margine bene limitatus et linea nigra cinctus; gonidia palmellacea, 8–11 mic. lata; hyphae thalli non amylaceae. Apothecia crebra, minuta, ad 0.25 mm. lata, nigra, opaca, lecideina, adpressa, rotunda, primum concaviuscula vel fere urceolata, margine tenui et prominulo, integro cincta, demum plus minus plana vel convexula, margine depresso; excipulum fuligineum, dimidiatum, 70–85 mic. crassum; hypothecium fuscescens; hymenium superne umbrino-fuscum, NO_3-, caeterum decolor et purum, 75–80 mic. altum, J violaceo-coeruleum; paraphyses filiformes, 3–4 mic. latae, simplices, eseptatae, ad apicem clavatae et infuscatae, gelatinose conglutinatae; asci ellipsoideo-clavati, superne rotundati et membrana incrassata cincti, 8 spori; sporae in ascis 2–3 seriales et oblinquae, diu decolores, demum fumoso-olivaceae, ellipsoideae vel subovales, utrinque bene rotundatae, rectae, uniseptatae, cellulis membrana inaequaliter incrassata, luminibus cellularum subtriangularibus vel subcornutis, circa 2/3 longitudinis sporarum metientibus, ad septa normaliter non constrictae, 22–23 × 8–12 mic.

On rocks in an open field near Naranjito, Fink *236*.

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NOTES ON THE AGARICACEAE OF VANCOUVER (B. C.) DISTRICT—I

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The area dealt with in this article, although comparatively small, is one with an extensive and varied list of Agarics. Owing to the climatic conditions, satisfactory collecting of the fleshy fungi may be accomplished in this district at two seasons of the year. The summer months are normally dry, and but few forms are then to be seen. With the advent of the rainy season, which usually commences toward the end of September, the mushroom flora at once becomes prominent, and continues so until the first sharp frost, which kills the majority of the species. Some forms still persist, however, throughout the winter months, particularly members of the genus *Mycena*, which appear to be peculiarly resistant to low temperatures. The second period of abundance comes in the spring, when the moisture of the winter together with the warmer weather again brings forth a plentiful variety of forms, which continue to flourish until the dry summer weather has definitely set in. September, October, November, December, March, April, and May, are therefore the best collecting months.

The work was begun in the fall of 1926 and has been continued up to the present time, but circumstances would not permit of undivided attention to the subject during the most favorable seasons. The list, therefore, is not complete, but is a contribution towards further investigations in this field. Approximately 130 different species have been collected, and have been recognized as being distinct species, but it has been impossible to identify all of these forms with certainty, further comparative work being necessary to clear up some of the difficulties. The following list includes 81 species of whose identity there is no doubt, and a few others which have been carefully worked out and have been found to be closely related to one or two species, not fitting any one description exactly.

In several cases interesting variations have been observed, and where these are outstanding, a note has been added along with the species. Variations in size were to be expected in some cases, due to the mild weather and abundant moisture during the growing season. In some cases variations in taste and smell occurred. For instance, *Panus stipticus* Fr. is found here with very little taste, if any, in the young forms and also in the mature forms after fairly moist weather, and *Psalliota subrufescens* Pk. lacks both the taste and the smell that is supposed to be characteristic of this species. This would lead us to believe that local modifications in size, taste and smell do occur, and that these characters are not to be relied upon too much for specific differentiation.

The greatest difficulty has been encountered in the genera *Mycena*, *Marasmius*, *Stropharia*, and *Gomphidius*, in which the available literature is insufficient to enable us to identify our forms with certainty. This may be due to the presence here of some new species, but none have been included in this work. So many intermediate forms have been collected, especially in the genus *Mycena*, that it makes us wonder if several of the so-called species are not merely varieties of one species.

The white-spored agarics are by far the most abundant, being represented by 16 genera and 49 species. Purple-brown-spored forms come next with 4 genera and 12 species, followed by ochre-spored forms with 8 genera and 11 species, and black-spored forms with 4 genera and 6 species. The rosy-spored forms are poorly represented, only 2 genera, with 3 species having been satisfactorily identified.

In the following list the genera and species are arranged in alphabetical order within each spore group, and forms which have been found to be closely related to certain species, fitting no one species exactly, are placed in the genus to which they belong, and are marked by an asterisk.

The writer takes this opportunity to acknowledge her indebtedness to Prof. F. Dickson of this University, who has given so much valuable assistance both in the study of the various forms found here, and also in the preparation of the manuscript.

In the following descriptions "Fall" includes September, October, and November; "Winter" includes December, January, and February; "Spring" includes March, April, and May.

WHITE-SPORED GROUP

I. AMANITA

Collected infrequently, from widely separated localities. One species.

1. *Amanita muscaria* Fr. Solitary, in leaf mould in mixed woods. Spring. Infrequent.

II. ARMILLARIA

Represented by one species which occurs frequently.

2. *Armillaria mellea* Fr. Caespitose, mostly on alder and fir. Fall and spring. Common.

III. CANTHERELLUS

Represented by one species.

3. *Cantherellus aurantiacus* Fr. Gregarious, in leaf mould in mixed woods. Fall. Common.

IV. CLITOCYBE

Well represented, but presenting considerable difficulty in determining species. Six species have been recognized.

4. *Clitocybe candida* Bres. Gregarious, in humus in mixed woods. Fall. Fairly common. Grows very large, up to 22 cm. in diameter.
5. *Clitocybe catina* Fr. Gregarious, on lawns. Fall. Common.
6. *Clitocybe inversa* Ricken. Gregarious, in mixed woods. Fall. Common.
7. *Clitocybe laccata* var. *amethystina* Bolt. Caespitose, amongst moss and decaying leaves in moist mixed woods. Fall. Infrequent. The gills of this form were so waxy that it looked much more like an *Hygrophorus* than a *Clitocybe*, but there is no doubt as to its being the late fall form of *Clitocybe laccata* var. *amethystina*.
8. *Clitocybe nebularis* Fr. Solitary or gregarious, in mixed woods. Fall. Fairly common.

9. *Clitocybe pithyophila* Fr. Gregarious to caespitose, on lawns. Fall. Common.

V. COLLYBIA

Only two species so far have been definitely determined.

10. *Collybia conigenoides* Ellis. Grows very abundantly in the fall, attached to buried or half-buried cones of Douglas fir (*Pseudotsuga taxifolia*). Our forms grow as large as 12 mm. in diameter, and the cystidia are broadly ventricose to sub-capitate. This differs slightly from Kauffman's description of the species (Kauffman, Agaricaceae of Michigan, p. 772), but complete descriptions of other cone-inhabiting species are lacking.
11. *Collybia dryophila* Fr. Gregarious to caespitose, in humus in mixed woods. Fall. Infrequent.

*. *Collybia* sp. This is a small form which was growing amongst the fallen leaves and needles in mixed woods. Its long root-like prolongation was a very outstanding characteristic. It differs from *C. longipes* Fr. (Kauffman, p. 770) in being smaller and without a velvety pileus. It might be *C. conigena* Fr.-Bres., with which it agrees in color, size, and the root-like prolongation, but it was not attached to cones, and was growing just amongst the needles and humus. It seems to be nearest to *C. conigena* Fr.-Bres., but it cannot be placed there with certainty until a more complete description of that species is available.

VI. HYGROPHORUS

Represented by four species, some of which are of frequent occurrence.

12. *Hygrophorus ceraceus* Fr. Gregarious in humus and moss in mixed woods. Fall. Common. Grows as large as 5 cm., is moist, scarcely viscid, and has short spine-like hairs along margin of pileus.
13. *Hygrophorus eburneus* Fr. Gregarious in humus in mixed woods. Fall. Fairly common.
14. *Hygrophorus miniatus* Fr. Gregarious in decaying leaves in mixed woods. Fall. Rare. Colors of pileus and gills exceptionally vivid.

15. *Hygrophorus psitticinus* Fr. Solitary, in decaying leaves in mixed woods. Fall. Rare.

VII. LACTARIUS

Only one species collected.

16. *Lactarius subdulcis* Fr. Gregarious in decaying deciduous leaves along edge of stream. Fall. Rare. The cuticle has a peppery taste, but the flesh itself is mild.

VIII. LENTINUS

One species collected.

17. *Lentinus ursinus* Fr.-Bres. Gregarious to sub-imbricate on rotting wood. Fall and spring. Infrequent.

IX. LEPIOTA

Represented by two species.

18. *Lepiota Friesii* Lasch. Gregarious to caespitose. In decaying leaves in mixed woods. Fall. Rare.
19. *Lepiota rubrotincta* Pk. Gregarious in decaying leaves in mixed woods. Fall. Fairly common.

X. MYCENA

Very well represented, presenting several forms which have not yet been definitely identified. A careful study of this genus seems desirable, as there doubtlessly occur in our locality several intergrading forms which would warrant the revision of certain species as at present described. Most of the species listed here are of frequent occurrence.

20. *Mycena acicula* Fr. Gregarious amongst fallen needles, coniferous woods. Fall. Common.
21. *Mycena alcalina* Fr. Caespitose on mossy logs, in mixed woods. Fall, winter, spring. Common.
22. *Mycena ammoniaca* Fr. Gregarious amongst decaying leaves in mixed woods. Fall, winter, spring. Common.
23. *Mycena atroalba* Fr. Gregarious in humus in mixed woods, usually attached to twigs or cones. Fall, winter, spring. Common.
24. *Mycena clavicularis* Fr. var. *luteipes* Kauff. Sparsely gregarious in humus in mixed woods. Fall. Fairly common.

25. *Mycena cyaneobasis* Pk. Gregarious in humus in mixed woods. Fall and spring. Fairly common.
26. *Mycena excisa* Fr. Caespitose on decaying wood. Spring. Common.
27. *Mycena galericulata* Fr. Caespitose on decaying wood. Spring. Common.
28. *Mycena haematopa* Fr. Caespitose on decaying wood. Fall and spring. Common. (See note at end of this genus, marked by an asterisk.)
29. *Mycena inclinata* Fr. Caespitose on decaying wood. Fall and spring. Common.
30. *Mycena leptocephala* Fr. Caespitose on decaying wood. Fall and winter. Fairly common.
31. *Mycena minutula* Pk. Gregarious, in moss on living maple. Spring. Common.
32. *Mycena parabolica* Fr. Gregarious, in humus in mixed woods. Spring. Common. Our forms grow much larger than is usual for this species, reaching a diameter of 5 cm. No cystidia were seen, but sterile cells were present, globose and finely spiny. This disagrees with Kauffman's description of this species. (Kauffman, Agaricaceae of Michigan, p. 800.)
33. *Mycena polygramma* Fr. var. *albida* Kauff. Caespitose, on decaying wood. Spring. Infrequent. This form varies from Kauffman's description (Kauffman, Agaricaceae of Michigan, p. 801) in lacking cystidia. It closely resembles *M. polygramma* Bull. as illustrated by Atkinson (Atkinson, Studies of American Fungi, p. 94), but Kauffman says that Atkinson's form should be named *M. praelonga* Pk. Our species, however, differs from *M. praelonga* Pk. (Kauffman, Agaricaceae of Michigan, p. 809) in having an almost white pileus, and gills remaining pure white.
34. *Mycena pura* Fr. Gregarious, amongst decaying leaves in mixed woods. Fall and spring. Infrequent.
35. *Mycena rosella* Fr. Sparsely gregarious, in humus in mixed woods. Fall. Fairly common. Our forms are below the average size given for this species.

36. *Mycena sanguinolenta* Fr. Gregarious, on and around old stumps. Fall and spring. Common.

*. An interesting *Mycena* has been collected on several occasions which seems to be intermediate between *M. sanguinolenta* and *M. haematopa*. It has the crenate edge on the cap characteristic of *M. haematopa* combined with the dark-edged gills of *M. sanguinolenta*. The red edge on the gills is much narrower than in *M. sanguinolenta*. Whether this is a distinct species, or whether it is a form of one of the already described species, or whether it would lead us to believe that *M. sanguinolenta* and *M. haematopa* are really not different species, remains to be seen. The three types are quite commonly found here.

XI. OMPHALIA

Represented by rather few species, two of which have been determined.

37. *Omphalia campanella* (Batsch.) Fr. In dense clusters on moss-covered logs. Fall. Common.

38. *Omphalia umbellifera* Linn. Densely gregarious on old stumps and logs. Spring, common; fall, infrequent.

XII. PANUS

Represented by two species. Occurrence rather infrequent.

39. *Panus angustatus* Berk. Caespitose, on decaying wood. Fall and winter. Infrequent.

40. *Panus stipticus* Fr. Caespitose to imbricate, on fallen fir. Spring. Infrequent. The taste is not nearly so astringent as Kauffman describes it (Kauffman, Agaricaceae of Michigan, p. 48), but whether this is due to the immaturity of the specimens, or the abundant rain previous to collection, or whether it is a local variation, is not known.

XIII. PLEUROTUS

Represented by two outstanding species.

41. *Pleurotus candidissimus* B. & C. Caespitose to imbricate, on decaying log. Fall. Fairly common.

42. *Pleurotus serotinus* Fr. Imbricate, on fallen alder. Winter and spring. Fairly common.

*. *Pleurotus sapidus* Kalch.? Imbricate, on decaying wood. Fall. Very common. The color of the spores in mass has yet to be ascertained to separate this form with certainty from *P. ostreatus*, but the gills do not anastomose, so that it tends to lean towards *P. sapidus*.

XIV. RUSSULA

Two species have been collected, both of fairly common occurrence.

43. *Russula emetica* Fr. Solitary, or in two's or three's, amongst decaying leaves in mixed woods. Fall. Fairly common.
44. *Russula veternosa* Fr. Solitary, or in two's or three's, amongst decaying leaves in mixed woods. Fall. Common.

XV. SCHIZOPHYLLUM

Represented by one species, which is fairly common.

45. *Schizophyllum commune* Fr. Imbricate on dead or living trees. Fall, winter, spring. Common.

XVI. TRICHOLOMA

Represented by several species, four of which have been definitely determined. Some are of very common occurrence.

46. *Tricholoma laterarium* Pk. Gregarious, amongst decaying leaves in mixed woods. Fall. Fairly common. Kauffman places this amongst the whitish forms in his key (Kauffman, Agaricaceae of Michigan, p. 680), whereas our specimens possess a brick red pileus. In other respects, however, it agrees with the description.
47. *Tricholoma nudum* Fr. Gregarious on lawns and edges of flower beds. Fall and winter. Very common.
48. *Tricholoma panoeolum* var. *caespitosum* Bres. Gregarious to sub-caespitose, amongst decaying leaves in mixed woods. Fall. Fairly common.
49. *Tricholoma sordidum* Fr. Gregarious to caespitose, on lawns and flower beds. Fall and winter. Very common. The identification of this form was very difficult, due to the pinkish-ochraceous tinge to the spores in mass. The gills are at length emarginate, and all the characters point to the genus *Tricholoma*. Some of the species of

this genus are recorded as having spores not truly white in mass, but no reference was found to this condition being present in *T. sordidum*. It grows commonly associated with *T. nudum*, from which it differs in its larger size, light vinaceous-drab color, and the stem, when cut, lacks the blue or purple color.

*. *Tricholoma* sp. (near *T. grave* Pk.). This form has so far eluded identification. It is a very broad (14.5 cm.), very squat form, the length of the stem never more than 4 cm., so that the thick pileus seems to be hardly raised off the ground. It is a brownish-gray color, and was growing in the fine gravel at the edge of a stream. Gills narrowly adnate, almost free. From the large size of the pileus and the color, it might be *T. grave* Pk., but the rooting character of this species was not observed.

OCHRE-SPORED GROUP

XVII. CORTINARIUS

This genus is better represented than any of the other genera in this group. Several species have been collected, but only three have been satisfactorily identified.

50. *Cortinarius alboviolaceus* Fr. On mossy ground in mixed woods. Fall. Infrequent.
51. *Cortinarius squarrosus* Clem. In dense clusters with stems confluent at base, on lawns and around flower beds. Fall and winter. Common.
52. *Cortinarius rigidus* Ricken. Gregarious on twigs of elder (*Sambucus*) and cat-tail (*Typha*) which had fallen on the wet ground around the edge of a lake. Spring. Fairly common in that particular habitat.

XVIII. CREPIDOTUS

Represented by two species.

53. *Crepidotus mollis* Fr. Imbricate on fallen Douglas fir. Fall. Infrequent.
54. *Crepidotus versutus* Pk. Sub-imbricate on decaying wood. Fall. Infrequent.

XIX. FLAMMULA

So far only one species belonging to this genus has been recorded, yet it is certain that more species will be added when more work has been done on it.

55. *Flammula echinulisporus* Murr. Solitary, on roots of cedar (*Thuja*). Fall. Rare.

XX. HEBELOMA

This genus has been recognized, but the species which have been collected here have not yet been satisfactorily identified. A summary of observations on two species is included here.

*. *Hebeloma* sp. (near *H. albidulum* Pk.). Gregarious, in humus in mixed woods. Fall. Infrequent. This form is placed near the species *H. albidulum* with some hesitancy, because of the difficulty experienced in determining the true condition of the cortina in the earliest stages. Kauffman (Kauffman, Agaricaceae of Michigan, p. 470) in his key separates the species on the basis of the presence, absence, or evanescent character of the cortina. In the young specimens examined, no trace of a cortina could be found, and it was therefore assumed to be absent, our form resembling in this respect *H. albidulum*. Definite differences occur, however. The pilei of our form are larger, reaching 7.5 cm. in diameter; the gills tend to be fairly broad rather than narrow; the stem is decidedly bulbous rather than sub-bulbous, and cystidia are not numerous.

*. *Hebeloma colvini* Pk.? Gregarious, in humus in mixed woods. Winter. Infrequent. This agrees fairly well with descriptions of *H. colvini*, but as only two specimens were collected, and only one of them showed the soil adhering like a bulb at the base, that may not be really typical of our forms. Our specimens were found growing in woods, not in "sandy soil in open places" as in Peck's description (Kauffman, Agaricaceae of Michigan, p. 481).

XXI. GALERA

Represented by one species.

56. *Galera tenera* Fr. Gregarious, in grass along roadsides. Spring. Fairly common.

XXII. NAUCORIA

Represented by two species.

57. *Naucoria semiorbicularis* Fr. Gregarious, amongst grass by roadside ditch. Spring. Fairly common.

*. *Naucoria lignicola* Pk.? Gregarious, amongst moss on bark of living hemlock (*Tsuga*). Spring. Fairly common. Our form differs from *N. lignicola* mainly in the smaller pilei (4–5 mm.), and the much larger spores. The measurements for our spores are 10–11 $\mu \times 6$–7 μ as compared with 7–8 $\mu \times 3$–4 μ for *N. lignicola* as recorded by Kauffman (Kauffman, Agaricaceae of Michigan, p. 513).

XXIII. PAXILLUS

This genus is of infrequent occurrence, and is represented by only one species.

58. *Paxillus involutus* Fr. Gregarious, amongst bracken and grass at side of road. Fall. Infrequent.

XXIV. PHOLIOTA

Represented by two species which were very easily recognized, though of infrequent occurrence here.

59. *Pholiota adiposa* Fr. Caespitose, on log in moist mixed woods. Fall. Infrequent.

60. *Pholiota destruens* (Fr.) Bres. Sub-caespitose to sub-imbricate, on end of poplar log, in Forest Products drying shed. Fall. Rare.

PINK-SPORED GROUP

XXV. ENTOLOMA

Represented by two species.

61. *Entoloma sericeum* Fr. Densely gregarious to caespitose, on lawns and flower beds. Fall and winter. Common.

62. *Entoloma speculum* Fr. Gregarious to sub-caespitose, amongst fallen leaves in moist, mixed woods. Fall.

Infrequent. The nucleate condition of the spores which Kauffman mentions (Kauffman, Agaricaceae of Michigan, p. 559) is not evident in our form.

XXVI. PLUTEUS

Of very rare occurrence. Represented by only one species, which, so far, has been collected only once.

63. *Pluteus cervinus* Fr. Gregarious, on old stumps. Fall. Rare.

PURPLE-BROWN-SPORED GROUP

XXVII. HYPHOLOMA

The outstanding genus of this group, almost all the species recorded in this genus being of frequent occurrence.

64. *Hypholoma capnoides* Fr. Gregarious, amongst fallen leaves in mixed woods. Fall and early winter. Common.
65. *Hypholoma epixanthum* Fr. Densely caespitose, on dead stumps. Spring. Fairly common.
66. *Hypholoma fasciculare* Fr. Densely caespitose, on decaying Douglas fir in woods. Fall. Common.
67. *Hypholoma hydrophilum* Fr. Sub-caespitose to caespitose on bark of fallen tree. Fall and winter. Common.
68. *Hypholoma sublateritium* Schaeff. Caespitose, on roots of conifers. Spring. Common.
69. *Hypholoma velutinum* (Fr.) Quel. Gregarious, amongst fallen leaves in woods. Fall. Infrequent.

XXVIII. PSALLIOTA

Not very frequently collected.

*. *Psalliota abruptibulba* Pk. Solitary, on ground in mixed woods. Fall. Infrequent. The annulus was not noticeably double in the forms collected, this differing from the typical *P. abruptibulba* (Kauffman, Agaricaceae of Michigan, p. 237).
70. *Psalliota haemorrhodaria* Fr. Solitary, amongst decaying leaves in mixed woods. Winter. Infrequent.
71. *Psalliota placomyces* Pk. Gregarious, amongst decaying leaves in mixed woods. Winter. Fairly common.

72. *Psalliota subrufescens* Pk. Sparsely gregarious, amongst fallen leaves, edge of mixed woods. Fall. Infrequent.

XXIX. PSILOCYBE

Represented by one species.

73. *Psilocybe subviscida* Pk. Gregarious, in mossy recently burned-over field. Spring. Common.

XXX. STROPHARIA

Represented by two species.

74. *Stropharia albonitens* Fr. Gregarious, amongst fallen leaves in mixed woods. Fall and winter. Fairly common.
75. *Stropharia stercoraria* Fr. Gregarious, on manure heap. Fall. Fairly common.

BLACK-SPORED GROUP

XXXI. COPRINUS

Represented by two species.

76. *Coprinus comatus* Fr. Gregarious, on lawns and other grassy places. Fall. Fairly common.
77. *Coprinus micaceus* Fr. Caespitose, in humus in mixed woods. Fall. Fairly common.

XXXII. GOMPHIDIUS

A rare genus, represented by one species.

78. *Gomphidius maculatus* Fr. Gregarious, amongst fallen leaves along roadside. Fall. Infrequent. Specimens were collected from two widely separated localities and seemed to be all the same species. They are slightly larger than Kauffman (Kauffman, Agaricaceae of Michigan, p. 170) describes, reaching 6 cm. in diameter, and the veil was not quickly evanescent.

XXXIII. PANAEOLUS

Fairly commonly found, on dung and on lawns recently manured. Represented by two forms which have been definitely determined, and one doubtful species.

79. *Panaeolus campanulatus* Fr. Caespitose, on recently manured lawns. Fall. Fairly common.

80. *Panaeolus retirugis* Fr. Gregarious, on manure heap. Fall. Fairly common.

*. *Panaeolus solidipes* Pk.? Gregarious, on manure heap. Fall. Infrequent. Our forms were brown in color, with a polished surface, 4–5 cm. in diameter, and had a striate stem. The size and the striate stem seem to justify its being placed in this species, although the color of the cap is darker than that given in the description (Kauffman, Agaricaceae of Michigan, p. 228).

XXXIV. PSATHYRELLA

Represented by one species.

81. *Psathyrella crenata* (Lasch.) Fr. Caespitose, on humus in mixed woods. Fall. Fairly common.

DEPARTMENT OF BOTANY,
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MOSS-MITES AS SPORE-BEARERS

ARTHUR PAUL JACOT

(WITH 1 TEXT FIGURE)

While making detailed studies of the external anatomy of Oribatoid Acarina, I have repeatedly noted the occurrence of fungus spores both within and attached to the outer walls of their bodies. This association has been specially noticed in connection with the following three types of mites: (1) adhering to the very rough, corrugated, vermiculate or areolated surface of the large Udetaliodes (Neoliodes of authors) which were studied from the eastern states, northeastern China and the Pacific Islands, (2) adhering to or caught in joints of species of the Galumninae (for figures see Jacot, American Oribatid Mites of the Sub-family Galumninae, Bull. Mus. Comp. Zoöl., 69 (1929),

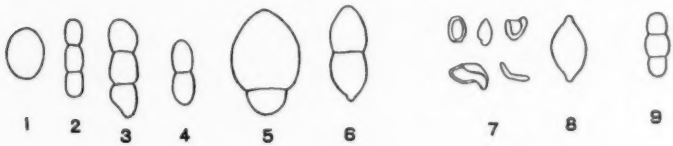


FIG. 1. Various spores found on species of phthiracarine mites from New York, Connecticut and Maine. Fig. 1: 0.0134 × 0.0097, also 0.01365 × 0.00975 and 0.00124 × 0.00101; fig. 2: 0.0123 long; fig. 3: 0.0156 × 0.00546; fig. 4: 0.0101 × 0.0039, also 0.01966 × 0.0123; fig. 5: 0.0135 × 0.00975; fig. 6: 0.0151 × 0.0078; fig. 7: 0.0209 × 0.0111, also 0.0117 × 0.0102 and 0.0156 × 0.0100; fig. 8: 0.0148 × 0.0082, also 0.0205 × 0.0082; fig. 9: 0.0159 × 0.0059. (Dimensions are in millimeters.)

1–37, pl. 3, fig. 24, pl. 6, fig. 55). In this last group spores are often found in the leg cupboards and behind the large leaf-like cupboard doors. This is similarly true of other species of Pterogasterines. (3) Within the body, under various conditions, one species being observed whose stomach was crammed with spores of one kind. These general observations led the writer to make a detailed study of the occurrence of spores on the

Phthiracaridae—chiefly because this group had just been studied and material was still at hand and most familiar. The results follow, but it must be borne in mind that (1) it is impossible to examine undehydrated specimens or parts, (2) it is not feasible to turn over specimens that have been mounted in balsam for some time, and, therefore, that faces whose planes lie at right angles to the plane of observation cannot be examined, (3) these mounted specimens have been picked up by means of a moist camel hair brush, have scrabbled over each other for as much as an hour, been killed in boiling water, preserved in alcohol, swashed about in their vials in a drawer for several months, transferred to absolute alcohol, boiled in same, then xylene and finally chased about in a xylene bath in sorting, before being finally mounted. With all this, specimens have been found with one to two dozen spores still adhering to their outer surfaces. Thus the survey is not by any means an indication of the maximum carrying capacity. An examination of 40 lots from New York, Maine, and Connecticut brought out the following facts:

Concerning occurrence: Specimens from (1) under face of bark, boards, slabs and twigs, usually on soft and decayed parts, bore spores, often many; (2) decayed logs and sticks likewise; (3) dead leaves, decaying grass of haystack, *Carex stricta* clump, either top (including fallen leaves and such detritus), or decayed mass on sides of stock, occasionally bore one or two spores; (4) cranberry bog sphagnum occasionally one or two spores but clumps of green sphagnum emerging from swamp level bore none; (5) moss of many kinds bore no spores.

Relation to carriers: Most of the species bore spores. None were found on *Steganacarus diaphanum* and *Pseudotritia simplex*, the two smallest species (and most easily searched). Although species of *Pseudotritia* and *Euphthiracarus* have the anogenital area formed so as to be more receptive than that of the relatively flat bottomed *Phthiracarus*, still the last often bore considerable numbers of spores, especially stuck along the edges of the covers. There are several *Pseudotritia ardua* with thirty odd spores, while the largest number found on a *Phthiracarus* is nineteen. Thus *Pseudotritia* is a better carrier.

Relative to location: Spores were found chiefly about the anterior edge of the genital covers; in the abdomen, especially the area occupied by the legs when retracted; among the legs and mouth parts and under the rim of the aspis (head shield).

Relative to kinds: In general there are many kinds, and of either one, two or three celled species. The largest single celled spore found measures 0.0205 mm. long and is nearly circular. For some others see figures. There seems to be no specificity, *i.e.*, any mite may carry any species of spore with which it may come in contact. One would expect that the majority of these spores belong to fungi dwelling on decaying wood or vegetable matter—the natural habitat of this subfamily.

Although few of the Phthiracarinae climb trees (I have records for only *Pseudotritia ardua* on apple tree) some of the Galumninae and most of the Udetaliodes, besides many other Oribatids, climb trees and ascend vegetation regularly. Udetaliodes are washed off by heavy rains and ascend on cool evenings. Galumninae which ascend herbs do so in the evening and drop off or climb down at dawn. Thus there is a daily migration up and down vegetation. To what extent there is lateral migration has never been determined but it must be considerable during rains. Judging from the number of spores left on mounted specimens, rains must wash off but very few. Thus it is a certainty that many of these mites carry spores and as there are often dozens or hundreds of individuals per square foot of meadow or forest-floor, respectively, the number of spores carried is not negligible.

To what extent such spores may be left on open tissue (the mites are plant feeders, being armed with heavy, shearing mandibles and maxillae) or scraped off on projecting plant parts, *i.e.*, to what extent plants may be inoculated by these carriers, has never been determined.

SHANTUNG CHRISTIAN UNIVERSITY, CHINA

NOTES ON PENNSYLVANIA USTILAGINALES. I[1]

GEORGE L. ZUNDEL

While on agricultural extension trips during the summers of 1928 and 1929, collections of various Ustilaginales have been made, as opportunity has been presented. This has resulted in finding three species of smuts and one new host for a very common smut, that have not previously been reported from this state. The asterisk (*) preceding the name of a smut or of a host plant indicates that it has not previously been reported from Pennsylvania. The following is a list of species of smuts found on the aforesaid trips together with the host plants, geographic distribution and dates of collection.

ENTYLOMA AUSTRALE Speg., Anal. Soc. Ci. Argent. **10**: 5. Jl. 1880.

On **Physalis subglabrata* Mack. & Bush:

Lancaster County: Clay, October 12, 1929.

SOROSPORIUM EVERHARTII* Ellis & Gall., Jour. Myc. **6: 32. 1890.

On *Andropogon scoparius* Michx.:

Monroe County: Stroudsburg, August 7, 1929.

On *Andropogon virginicus* L.:

Monroe County: Stroudsburg, August 7, 1929.

SOROSPORIUM SYNTHERISMAE (Peck) Farl., Farl. & Seym. Host Index N. Am. Fungi *152*. 1891.

On **Cenchrus tribuloides* L.:

Northumberland County: Montandon, October 8, 1929.

On *Panicum dichotomiflorum* Michx. (*P. proliferum* Am. auth. not Lam.):

Beaver County: Ambridge-Economy, September 28, 1928.

Dauphin County: Harrisburg, November 15, 1928; Middletown, October 23, 1928.

Erie County: Erie, September 12, 1928.

Franklin County: Chambersburg, October 25, 1928.

Luzerne County: Wilkes-Barre, September 11, 1929.

[1] Contribution from the Department of Botany, The Penn'a State College, No. 68.

Lycoming County: Williamsport, October 16, 1929.

SPHACELOTHECA HYDROPIPERIS (Schum.) DeBary, Verg. Morgh. Biol. Pilze 187. 1884.

On *Polygonum sagittatum* L.:

Berks County: Robesonia, October 4, 1928.

*TILLETIA HOLCI (Westend.) Rost., Bot. Tidskr. **22**: 256. 1899.

On *Holcus lanatus* L.:

Forest County: Red Brush (on the farm of N. A. Korb).

USTILAGO AVENAE (Pers.) Jens., Charb. Cereales 4. 1889.

On *Avena* spp.:

Clearfield County: Grampian, July 24, 1928.

Franklin County: Scotland, June 26, 1929.

USTILAGO HORDEI (Pers.) Kellerm. & Swingle, Ann. Rep. Kan. Agr. Exp. Sta. **2**: 268. 1890.

On *Hordeum* spp.:

Elk County: Wilcox, August 1, 1928; Hyde, August 27, 1928; Boot Jack, August 27, 1929. (Alpha barley.)

Jefferson County: North Point, July 25, 1928. (Bald barley.)

USTILAGO LEVIS (Kellerm. & Swingle) Magn., Abh. Bot. Ver. Prov. Brand. **37**: 69. 1896.

On *Avena* spp.:

Franklin County: Scotland, June 26, 1929.

USTILAGO NEGLECTA Niessl., Rab. Fungi Eur. 1200. 1868.

On *Setaria glauca* (L.) Beauv.:

Beaver County: Beaver Falls, September 24, 1928.

Berks County: Robesonia, October 4, 1928.

Centre County: State College, Sept. 3, 1928; Pine Grove Mills, September 18, 1928.

Erie County: Bell Valley, September 12, 1928; North East, September 12, 1929.

Juniata County: McAlisterville, September 20, 1929.

Lackawanna County: Ransom, September 21, 1928.

Lancaster County: New Danville, October 12, 1928.

Lebanon County: Jonestown, September 19, 1928.

Luzerne County: Orange, September 7, 1928.

Mercer County: Fredonia, September 11, 1928.

Northampton County: Mt. Bethel, October 5, 1928.

Pike County: Milford, September 7, 1929.
Union County: West Milton, September 8, 1928.
Warren County: Youngsville, September 13, 1928.

*USTILAGO OXALIDIS Ellis & Tracy, Jour. Myc. **6**: 77. 1890.

On *Oxalis corniculata* L.:

Bedford County: Buffalo Mills, August 7, 1928; Bedford, August 30, 1929.
Berks County: Leesport, October 4, 1928.
Blair County: Bellewood, August 8, 1928.
Centre County: State College, July 21, 1928; August 19, 1928.
Columbia County: Catawissa, September 26, 1929; Numidia, September 26, 1929.
Cumberland County: New Kingston, September 18, 1929; Walnut Bottom, September 18, 1929.
Elk County: Ridgway, August 26, 1929.
Forest County: German Hill, August 15, 1929; Tionesta, August 15, 1929.
Franklin County: Scotland, September 17, 1929; Waynesboro, September 17, 1929.
Jefferson County: Baxter, July 25, 1928; Brockway, August 27, 1929; Brookville, August 27, 1929; Roseville, August 27, 1929.
Juniata County: McAlisterville, September 20, 1929; Oakland, September 20, 1929.
Lawrence County: New Castle, August 21, 1928.
Luzerne County: Pikes Creek, September 6, 1929.
Monroe County: Stroudsburg, September 9, 1929.
Northumberland County: Dalmatia, September 5, 1929; Paxinos, October 1, 1929.
Snyder County: Selinsgrove, September 27, 1929.
Union County: Kelly Point, September 8, 1928.
Venango County: Franklin, August 14, 1929; July 26, 1928.
Warren County: Youngsville, September 13, 1928.
Washington County: West Brownsville, August 22, 1928.
Westmoreland County: Lycippus, September 26, 1928.
Wyoming County: Lake Winola, September 10, 1929; Nicholson, September 10, 1929.

On *Oxalis stricta* L.:

Adams County: Cashtown, September 5, 1928.
Columbia County: Catawissa, September 26, 1929.
Jefferson County: Punxsutawney, August 28, 1929; Reynoldsville, August 28, 1929.
Lancaster County: Elverson, August 28, 1928.
Luzerne County: Nescopeck, October 4, 1929; Orange, September 11, 1929.
Lycoming County: Cammal, September 14, 1928.
Northumberland County: Dalmatia, September 5, 1929.
Wyoming County: Noxen, September 20, 1928.

USTILAGO RABENHORSTIANA Kuhn, Hedwigia **15**: 4. 1876.

On *Digitaria sanguinalis* (L.) Scop.:

Armstrong County: Kittanning, September 25, 1928.
Beaver County: Beaver Falls, September 27, 1928.
Erie County: Erie, September 12, 1928.

USTILAGO STRIAEFORMIS (Westend.) Niessl, Hedwigia **15**: 1. 1876.

On *Phleum pratense* L.:

Franklin County: Lehmaster, June 26, 1929.
Jefferson County: Baxter, July 25, 1928.
Juniata County: Mifflintown, June 27, 1929.
Mercer County: Sharon, July 9, 1929.

USTILAGO UTRICULOSA (Nees) Tul., Ann. Sci. Nat. III. **7**: 102. 1847.

On *Polygonum lapathifolium* L.:

Mercer County: Fredonia, September 11, 1928.
Northumberland County: September 5, 1929.
Westmoreland County: Latrobe, September 26, 1928.

On *Polygonum pennsylvanicum* L.:

Luzerne County: Orange, September 7, 1928.
Lycoming County: Cammal, September 14, 1928.
Mercer County: September 8, 1929.
Pike County: Milford, September 7, 1929.
Union County: Kelly Point, September 8, 1928.
Wyoming County: September 20, 1928.

PENNSYLVANIA STATE COLLEGE,
STATE COLLEGE, PA.

NOTES AND BRIEF ARTICLES

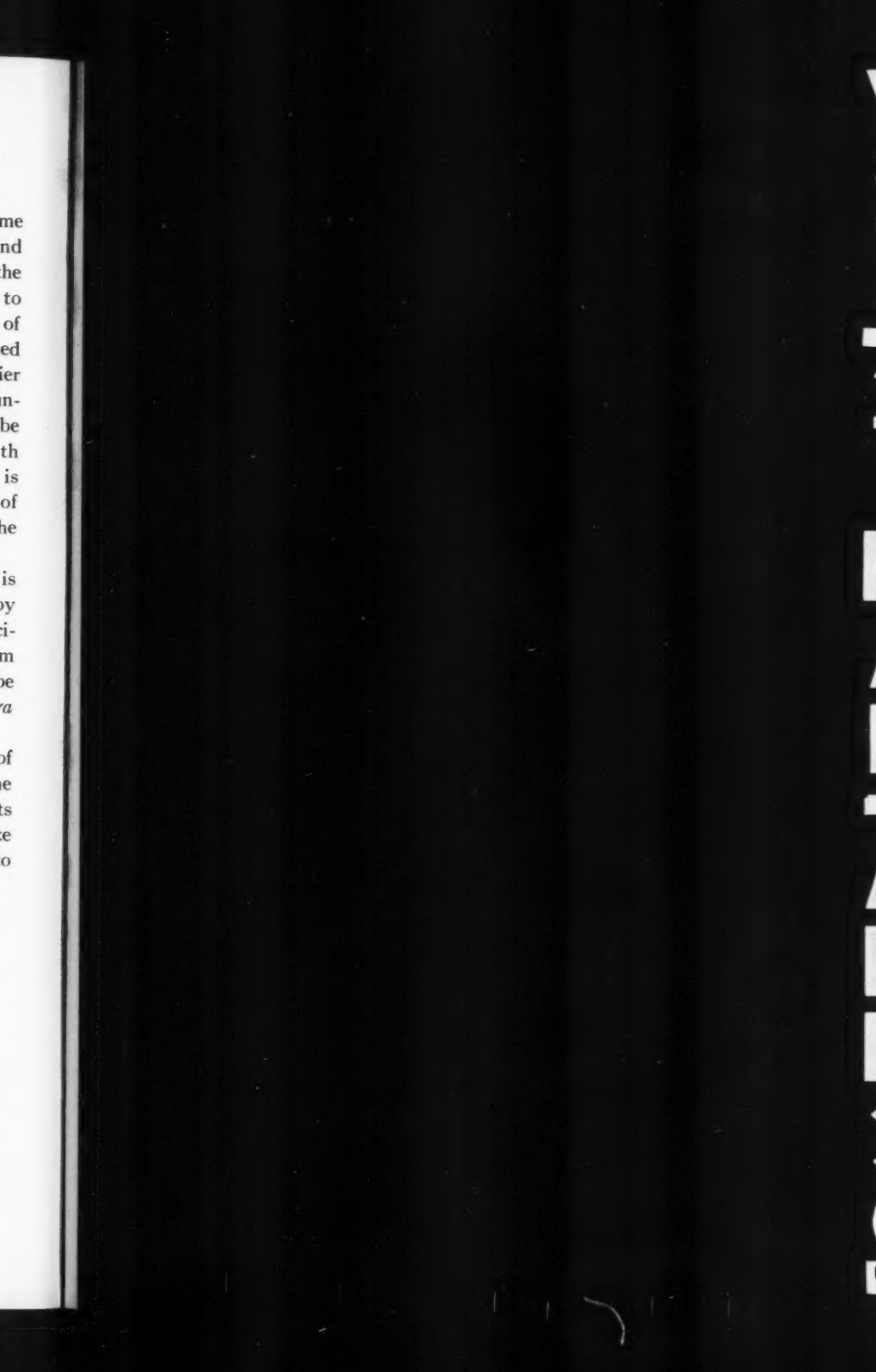
The meetings of the Mycological Section of the Botanical Society of America held in Des Moines, Iowa from December 30, 1929 to January 1, 1930 were well attended and the usual interest manifested in the various papers. The attendance was, however, doubtless reduced somewhat in anticipation of the meeting of the International Botanical Congress to be held in England next summer. The proximity of the State College at Ames gave the visitors a chance to look over the work of that institution, although the meetings of the Mycological Section were held in Des Moines. The New York Botanical Garden was represented by Doctors B. O. Dodge and F. J. Seaver and the substance of the papers presented by them was printed in the January issue of MYCOLOGIA.

A MONOGRAPHIC STUDY OF CERCOSPORA SPECIES OF THE WORLD

I think it will be of interest to mycologists and plant pathologists all over the world to know that a very thorough-going taxonomic study of the species of *Cercospora* of the world is being carried through by Dr. Charles Chupp of the Plant Pathology Department at Cornell University. Dr. Chupp, impressed with the difficulty of determining with certainty certain *Cercospora* species which he came across, some years ago began a comprehensive accumulation of the literature and herbarium material of species of this genus. This work has now been under way some ten years. Dr. Chupp has brought together the most complete bibliography of the literature bearing on the taxonomy of these species. He has a very extensive collection of specimens, among them many of the type species. He is making this his special research problem and expects to pursue it intensively, so far as his time allows, during the next few years. He is studying the species grouped by host families, and is, I believe, now in a better position to pass judgment on the identity of species in this genus than anyone else in the world.

While he does not propose to publish on this work for some time yet, he is, nevertheless, very willing to give information and assistance to any worker who may have a problem in the taxonomy of species of *Cercospora*. He has just pointed out to me that very recently descriptions of several new species of *Cercospora* have appeared in which the authors have used names already preëmpted for species of *Cercospora* by earlier workers. This merely adds to the synonymy of the subject unnecessarily. I would suggest that workers proposing to describe new species of *Cercospora* send specimens to Dr. Chupp with description and the name which they propose to use. He is most willing, he assures me, to give such workers full benefit of his knowledge of the genus and assist them in avoiding the application of names already applied to other species.

Dr. Chupp is not keen to publish new species himself but is very anxious to have new species described and published by workers anywhere. He will greatly appreciate duplicate specimens of type species as well as specimens of *Cercospora* from any collector who is willing to send them to him. He will be glad to undertake the determinations of collections of *Cercospora* which anyone cares to send him.

Dr. Chupp is a modest man. I have taken the liberty of calling attention to the work he is doing in the belief that he is rendering a great service to mycologists and plant pathologists and that most of them, the world over, will be glad to take advantage of Dr. Chupp's willingness to be of real service to anyone working on species of this genus.

H. H. WHETZEL